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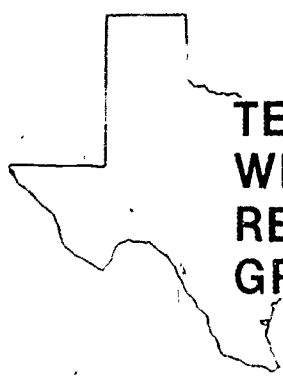
ABSTRACT
        This report provides information drawn from a study
that compared two components of the freshman English program at the
University of Texas at Austin. The first chapter of the report
contains background material and describes the two course
components--the analytic option, which emphasizes writing skills in
the context of complete pieces of writing, and the synthetic option,
which works from individual discourse parts to paragraphs to complete
essays. The second chapter discusses the research design and
procedures, while the third chapter analyzes some features of high
and low quality student essays. Chapters four and five offer
comparisons of essays written by students in the analytic option with
those written by students in the synthetic option. Chapter six
discusses the influence of writing apprehension on student
performance in freshman composition, and chapter seven outlines the
predictors of writing quality and course grades. The final chapter
places the study in the larger context of writing research conducted
at other universities and presents a summary of the study's findings,
its limitations, and its implications for teaching and research.
(FL)

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A COMPARISON OF ANALYTIC AND SYNTHETIC APPROACHES TO THE TEACHING OF COLLEGE WRITING

TWRG RESEARCH REPORT #1

Authors: Stephen P. Witte
Lester Faigley

A COMPARISON OF ANALYTIC AND

SYNTHETIC APPROACHES TO THE

TEACHING OF COLLEGE WRITING

by

Stephen P. Witte

and

Lester Faigley

The University of Texas at Austin

August 1981

Preface

This tome presents in some detail a comparative evaluation
of two components of the Freshman English Program at the University
of Texas at Austin. The evaluation focuses on the Freshman
English Program as it existed in the Fall of 1978. The evaluation
was begun in August of 1978 by Stephen Witte with the assistance
of James L. Kinneavy, Director of Freshman English, and Thomas
Cameron, an Assistant Instructor in the Department of English.
The analyses reported here were completed by Witte and Lester
Faigley, who joined the University of Texas faculty in September
of 1979, during the 1979-1980 academic year.

The authors wish to thank a number of persons who contributed
directly to the study in various ways. For Jim Kinneavy's advice
on the design of the study and for his making available to us some
of the resources of the Freshman English Office, we are most
grateful. For Tom Cameron's careful attention to the many details
associated with collecting the large amounts of data required
for the study, we are especially thankful. Without Kinneavy's
and Cameron's contributions this study could not have been
completed.

One of the major difficulties encountered in completing a
study of the magnitude of this one is organizing the various
pieces of data which were collected from each student. Merry
Eginiore, Paula Marks, Paul Meyer, and Tom Cameron provided
valuable assistance in that area.

Many of the analyses reported in the following pages
depend on the holistic ratings given to the four sets of student

report which follows. His comments were helpful at various stages during the writing process. We are equally grateful to Maxine Hairston for having read the typescript for the Texas Writing Research Group and for approving it for publication by that body and to Cindy Selfe for seeing that the manuscript was printed.

Finally and most importantly, we would like to thank the students and the teachers of the classes we evaluated. Without their cooperation we could not have done anything. We cannot, of course, thank the students individually, although their cooperation and good faith were essential. We do, however, extend our thanks to the teachers who endured through the ordeal of collecting data and gave us their appraisals of their courses and the evaluation project. These teachers were Noreen Kornman, Bruce Gentry, Mary Jean Gross, John Orth, Martha King, Jim McNutt, Debbie Hendrixson, Steve Harris, and Margaret Mahoney.

Stephen P. Witte

July, 1981

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CHAPTER 1

GENERAL INTRODUCTION

1.1 Background of the Present Study

The present study was undertaken in the fall of 1978 for
the specific purpose of comparing the relative effectiveness
of two curricular and instructional options for acquiring
credit in English 306, the introductory course in rhetoric
and composition at the University of Texas at Austin. We call
these two major options the analytic option and the synthetic
option. They will be described in detail below.

During the Fall of 1978, the analytic option served as
the introductory composition course for nearly 3,300 UT fresh-
men and the synthetic option served 130 freshmen. These stu-
dents had not received exemption credit by examination for
E 306. The unequal distribution of students within the two
options had continued for approximately four years prior to
the study. Students not only avoided enrolling in the synthe-
tic courses, but thirty percent of the students who did enroll
in the synthetic tutorial courses withdrew from them, an attri-
tion rate twice as high as for the analytic courses.

Few data existed indicating whether the option attracting
the fewer students was equal to, worse, or better than the

analytic option. Faced each year with the higher attrition rate and the higher cost per student credit hour of the synthetic option, Professor James Kinneavy, the Director of Freshman English, suggested a systematic comparison of the two options. Thus in August of 1978, Prof. Kinneavy, Prof. Stephen Witte, and Thomas Cameron, a doctoral student in English Education, wrote a research proposal calling for the comparative evaluation which is the subject of this report. During the analysis stage of the study, Prof. Lester Faigley, who joined the UT faculty in fall of 1979, worked with Prof. Witte on the project.

1.2 The Two Major E 306 Options

The Analytic Option. Several fundamental differences obtained between the two major E 306 options during the Fall Semester of 1978. We call the first option the analytic option because of its emphasis upon teaching writing skills in the context of complete pieces of writing rather than in isolation. The option served the larger number of UT freshmen and was taught in a conventional classroom setting with lecture-discussion as the principal instructional medium, although, of course, student conferences were a regular part of the instructional method. The rhetorical framework for the analytic option was provided in part by James Kinneavy's A Theory of Discourse (1971) and presented through a syllabus written primarily by Sue Rodi (1978) of the UT English Department. The underlying theory, with its emphasis on whole

discourses, provided the basis for a holistic approach to the
teaching of writing, and thus attended to the development of
writing skills in the context of three purposes of written
discourse--the expressive purpose, the persuasive purpose and
referential purpose--as realized through four discourse modes--
description, classification, narration, and evaluation. Those
interested in the derivation and application of several prin-
ciples underlying the analytic curriculum should consult
Kinneavy's A Theory of Discourse (1971), Aims and Audiences in
Writing (1976), and Writing--Basic Modes of Organization (1976).
The treatment of the purposes and modes of discourse in the
Rodi syllabus was supplemented by parallel treatments, when
available, in Adelstein and Pival's The Writing Commitment (1976)
and by exemplary readings from Decker's Patterns in Exposition 6
(1978). Instruction in using the conventions of Standard Written
English in the context of whole discourses was provided by
Corder's Handbook of Current English (1978).

Students enrolled in this option wrote during the course
of the semester the equivalent of six essays (500-650 words
each), not including the library paper, the journal, or the
two pretest essays and two posttest essays required by the re-
search design (see below). Of the six essays written to meet the
course requirement, generally two or three were written in class
and the remainder were written outside of class. Students enrolled
in this option had but one teacher and met regularly in classes
of 25 students each throughout the Fall Semester, some on a three-
day-per-week schedule with 50-minute class periods and some on a
two-day-per-week schedule with 75-minute class periods.

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The Synthetic Option. The second major E 306 option, the
option serving only about 3.5% of the students enrolled in E 306
during the Fall of 1978, employed a meristic approach to teaching
composition. This option, rather than working from the whole
discourse to its individual parts as in the analytic option,
approached the development of writing skills in a more deliberately
synthetic way, working from individual discourse parts--in particu-
lar, sentences--to paragraphs and, finally, to multiple-paragraph
essays. The rhetorical theory underlying this second E 306 option
was Francis Christensen's generative rhetoric developed through
the six essays included in his Notes Toward a New Rhetoric (1967),
adapted by Grady (1971) to the whole essay, and taught with fur-
ther adaptions through Wittig's Steps to Structure (1975), the
major textbook in the course.

The basic idea underlying this approach to composition is
that of the addition of increasingly more specific details, com-
parisons, etc.   to the base clauses of sentences, to the
topic sentences of paragraphs, and to the thesis statements of
essays. According to this underlying rhetorical theory, the sen-
tence is a structural and developmental microcosm of the essay.
Applied pedagogically in the second E 306 option, the theory meant
that by teaching sentence structure and development first, one
would, in fact, be teaching a miniature version of paragraph and
essay structure and development. Accordingly, skills developed
in writing sentences could be synthesized into the larger, more
complex skills required, first, in writing paragraphs and, second,
in writing essays. Because the text materials for the synthetic
option rely on considerable grammatical terminology, teachers in
this option used Blumenthal's English 3200 (1972), a programmed gramm

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text.   Initial instruction in English 3200 was intended to provide students with the competencies that would enable them to complete more sophisticated sentence-level exercises available through an interactive computer program developed under the direction of Wittig.   These exercises, in turn, prepared students to handle the treatments of paragraphs and essays contained in Wittig's Steps to Structure.   With this synthetic approach to the development of writing skills, the students enrolled in this second E 306 option did not write nearly so many essays--in fact, only two besides the pretest and post-test essays collected specifically for the comparative evaluation.

The students in the synthetic option did, however, produce, through the large number of sentence and paragraph exercises, a substantial number of words during the course of the semester.

Not only did this second E 306 option differ from the first along the dimensions of underlying rhetorical theory, but it also differed with respect to instructional media. Whereas the instructional medium of the analytic option consisted of conventional instruction offered in regularly scheduled lecture-discussion classes, the instructional media of the synthetic option consisted of individualized instruction offered with tutors in a laboratory employing computer-assisted instruction.   Thus while one teacher in an analytic course worked with 25 students, one teacher and three tutors, who were UT English graduate students without the M.A., worked with the 25 students enrolled in each of the sections of the

synthetic option. The effect of these differences in instruc-
tional media was, of course, to change the student-teacher
ratio at the beginning of the semester from 25-to-1 in the
analytic classes to about 6-to-1 in the laboratory classes.
Because of the attrition rate in the synthetic courses, this
latter ratio fell to about 4 1/2-to-1 by the end of the semes-
ter.

1.3 Use of Data Collected During the Evaluation

Although the present study was designed specifically to
compare the relative effectiveness of these two E 306 options,
the data collected also enabled the investigators to study
other research questions. In the present report, those data
are used to develop a "profile" of E 306 students, based
partly on features of "high" and "low" quality E 306 essays
and partly on measurements of E 306 students in general. Those
data are also used to identify a number of predictors and
correlates of writing quality. The analyses of these data
should prove useful in examining, for example, freshmen English
exemption procedures based on standardized test scores. They
should also prove useful to those at the University of Texas
charged with the responsibility of teaching writing and making
administrative decisions regarding the teaching of writing.

CHAPTER 2

RESEARCH DESIGN AND PROCEDURES

2.1 The Design of Ten Comparisons

In all, approximately 500 E 306 students were involved in the study reported here. This large number of students was required because tne two E 306 options we wished to compare were so remarkably different. As was pointed out above, the two courses differed with respect to underlying rhetorical theory, instructional media, and textbooks or text materials. The tree diagram in Figure 2.1 represents these differences graphically by showing the number of courses which would have had to be designed and offered simultaneously in order to control for all the major variables involved in the two E 306 options. The two options themselves are pictured, respectively, in the lower left

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Insert Figure 2.1 about here.

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right of the tree diagram and marked with asterisks. Figure 2.1 also suggests something of the logistical problems which would obtain should such a controlled comparison be attempted systematically: had we attempted to test for the effect on student

performance of all instructional variables, some 42 distinct E 306 options would have had to be offered. Obviously, such was not possible. We did, however, believe that we should, in addition to testing for the overall effect of the two E 306 options in question, test for the effect of the differing curricula in use in the two options and for the effect of the widely divergent instructional media. In addition, it was determined that we ought to study the effect on student performance within the analytic option of the Rodi syllabus.

The Five Principal Comparisons. The research design thus called for five specific comparisons, those identified in Figure 2.2, which extracts the relevant courses from the comprehensive tree diagram pictured in Figure 2.1.

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Insert Figure 2.2 about here.

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As Figure 2.2 and the appropriate legend show, comparison #1 tests for the relative effectiveness of the two E 306 options. Comparison #2 tests for the effect of "course content," focusing on the analytic curriculum as taught through the Rodi syllabus and the synthetic curriculum as taught through Wittig's Steps to Structure. In comparison #2, it will be observed, the instructional medium is controlled, in this case conventional classroom instruction. Comparison #5 is identical to comparison #2, except that in this case the instructional medium differs.

In comparison #5, the instructional medium is tutorial rather than conventional. Comparison #4 tests for the effect of instructional medium on student performance in the analytic course, with half of the students enrolled in a tutorial course and half in a conventional course; and comparison #3 tests for the effect of the Rodi syllabus on student performance in the analytic option. In this last comparison half the students used The Writing Commitment in a course guided by the Rodi syllabus, and half the students did not use The Writing Commitment but were exposed to the Rodi syllabus.

Sample Population and Control of Teacher Variable in the Five Principal Comparisons. Each of the five principal comparisons involved four sections of E 306 students, with approximately 50 students, or two sections, undergoing one instructional treatment and about 50 students, or two sections, undergoing the other treatment. Thus each of the five comparisons involved approximately 100 students. The students were not specifically selected at random from the population of E 306 students. However, of the 20 sections involved in the evaluation, 14 were randomly selected. The remaining six sections were made up of students who were, for the most part, channeled into the synthetic option by their advisors, who apparently believed that certain students--many of them athletes--by virtue of poor academic records or because of job-commitments would find the laboratory-tutorial course more suitable to their needs. With the possible exception of three or four of the six sections just noted, we are relatively confident that the sections involved in the study are

representative of the larger population of UT E 306 students.

In fact, when the pre-enrollment scores on the Scholastic

Aptitude Test, the English Composition Test, and the Test of

Standard Written English of the 500 students selected for the

present study and of all E 306 students were compared, no sta-

tistically significant differences were found. In each of the

five principal comparisons, the teacher variable was controlled.

Each comparison involved two teachers, and each teacher in a

given comparison 'taught one section on each side of the compari-

son. Thus altogether, 10 teachers, not including the tutors who

worked in the laboratory sections, and approximately 500 students

were involved in the study. These ten teachers all had previous

experience teaching freshman writing, averaging 8 semesters in

the college classroom, and all either had a Ph.D. or were near-

ing the completion of one.

The Five Derivative Comparisons. By pooling data from sec-

tions in which the same variable was controlled and by eliminat-

ing the controls exerted on the teacher variable in the five

principal comparisons, we were able to create five derivative

comparisons. Some of these derivative comparisons allowed us

to address questions which could not have been addressed by

means of the principal, comparisons specified in the original

research design. Other comparisons, following the removal of

controls on the teacher variable, merely allowed a larger number

of subjects to be used in the analysis, thus allowing us to,

answer certain questions using tests which were statistically

more powerful. These five derivative comparisons are the

following: (1) the analytic curriculum taught in a conventional

classroom setting compared with the synthetic curriculum taught

in a conventional classroom; (2) the analytic curriculum taught

in a conventional classroom setting compared with the synthetic

curriculum taught in a tutorial setting; (3) conventional class-

room instruction, regardless of underlying rhetorical theory,

compared with tut rial instruction, regardless of underlying

rhetorical theory; (4) the analytic curriculum, regardless of

instructional media, compared with the synthetic curriculum, re-

gardless of instructional media; and (5) the analytic curriculum

taught in a conventional classroom setting, compared with the

analytic curriculum taught in a tutorial setting.

2.2 Pretest and Posttest Data

- The research design for the present study was a pretest-

posttest design. However--and this is a major weakness in this

study as it is in nearly all studies of composition curricula to

date--no control groups as such (see Campbell and Stanley, 1966)

were provided for. That is to say, all students for whom data

was either available or from whom data was collected were, dur-

ing the Fall Semester of 1978, undergoing composition instruction

of one of the kinds described above. Although we would have

preferred to have had at our disposal a control group which was

not undergoing some instruction in composition and at the same

time was experiencing all of the other aspects of college life,

university regulations and enrollment practices precluded our

identifying and studying such a group. Hence when gains across

time are reported for the various instructional treatments studied or when one instructional treatment is found to be more efficacious than another, it is important to keep in mind that we simply do not know whether a group of comparable students undergoing no instruction in composition would have performed as well or worse than the group or groups in question at the end of the semester.

Measures.   Pretest and posttest essays were analyzed both qualitatively and quantitatively. Essays were rated for overall quality by experienced teachers of writing in a holistic evaluation described later in this chapter. The The essays were also submitted to quantitative analyses. The number of words in each essay was counted, and four syntactic measures used in previous research studies of college writing were computed. These four measures are described in Chapter 3. Besides the essay measures, pretest and posttest data were collected on three subtests of the McGraw-Hill Writing Test-- language mechanics, sentence patterns, and paragraph patterns--as well as the total score on the Writing Test. Data were also collected for the paragraph comprehension subtest of the McGraw-Hill Reading Test. These data allowed us to measure the development of writing-related skills, especially usage and mechanics, and to gauge the effect of E 306 on reading skills. Writing anxiety, a trait that has been shown to affect writing performance, was measured by the Daly-Miller Writing Apprehension Test.

The Writing Topics. The instruments used to collect the pretest and posttest essay data were selected so that performance

could be measured along a number of dimensions--(1) writing
performance on a "personal experience" writing assignment which
depended heavily on narration and description; (2) writing
performance on an "argumentative" writing assignment; (3) mas-
tery of basic writing skills as measured on an objective test;
(4) mastery of reading comprehension skills as measured on an
objective test; and (5) writing apprehension or anxiety as
measured on an objective instrument. The first four and last
four class meetings of a MWF class were devoted to collecting
the data analyzed subsequently in this report: two pretest
essays and two posttest essays; the McGraw-Hill Writing Test,
Form A and Form B (Raygor, 1970b); the McGraw-Hill Reading
Test (paragraph comprehension section only), Form A and Form B
(Raygor, 1970a); the Daly-Miller Writing Apprehension Test (WAT)
(Daly and Miller, 1975), pre and post.

The first set of writing topics, the A_1/B_1 Topics, were
those used as pretest-posttest measures in the Miami University
sentence-combining experiment (Morenberg, et al., 1978). They
read as follows:

Topic A_1

Each of us behaves differently when we move from one group
to another. We play different roles in different situations.
For example, we do not act at home precisely as we act on dates,
in the classroom, or before an employer. Nor do we behave with
a single friend as we behave with a group of friends.

In an extensive and detailed essay, develop your ideas about
the changes in our behavior. Use specific illustrations from
your personal experience, from observations of others, or from
books, movies, and television. You may want to explore questions
of your own or answer questions like these: Why do we act differ-
ently in different situations? Are the changes in our behavior

motivated by some need? Are other people misled by our behavior changes? Do such changes indicate something insincere or hypocritical about us? What happens when we do not change our behavior from one situation to another?

Topic B_1

Each of us likes to escape from reality. We often make believe that our world is different than it is. For example, we imagine ourselves reigning as homecoming queen or serving as class president, scoring the winning touchdown, or dating the most popular person in school. We identify with heroes and heroines of adventure movies, romantic stories, science fiction, and athletic events.

In an extensive and detailed essay, develop your thoughts about escaping from reality. Use specific illustrations from your personal experience, from observations of others, or from books, movies, and television. You may want to explore questions of your own or answer questions like these: Why do we escape? Is our desire to do so motivated by some need? Do you think that escape is irresponsible? harmful to ourselves and society? beneficial? necessary? satisfying? Do we escape in different ways? Do we escape less often and less completely as we mature? What happens if we are unable to escape?

The second set of topics were designed by Cameron and Witte to ellicit written discourse of a different kind. With the A_2/B_2 Topics, it was hoped that the E 306 students would adopt a position on a controversial topic, defend that position, and try to urge an audience to adopt a similar position. These topics read as follows:

Topic A_2

One issue commanding a great deal of attention nationally is the significant decline in the ability of high school graduates to read and to write. At least one solution to this "literacy crisis" has been proposed. The proposed solution would require high school students to demonstrate that they can read and write well before they graduate from high school. As might be expected, reactions to this proposed solution are divided. Some people insist that such a requirement would be unfair to the students because knowing how to read and write well is not necessary in many of the jobs for which high school graduates qualify. Other people insist that employmer skills are not at issue. These other people insist that by knowing how to read and write well

the individual is more likely to continue growing intellect-
ually, socially, and culturally after his or her high school
years.

In a multi-level essay (that is, an extensive and detailed
essay), argue objectively for one point of view or the other.
Your argument should be well organized and easy to follow. It
should be unified and complete, and it should be free of all
logical fallacies or errors in reasoning. Support for your posi-
tion should come from your knowledge of the issue and its impli-
cations, and that support should be presented objectively without
the use of first-person pronouns. Before you begin to write, you
may want to explore questions of your own or to explore questions
such as these: Are reading and writing essential to the full
development of the individual? Would an individual deficient in
reading skills be more likely to be misled by television commer-
cials, by newspaper and magazine advertisements? How do well-
developed, or underdeveloped, reading and writing skills affect
people's lives? Is there any relationship between reading and
writing skills and the ability to appreciate cultural artifacts
such as movies, poems, popular songs, novels, or television shows?
Are reading and writing related to employment opportunities? to
successful employment?

Topic B_2

Composition courses are required in many high schools for
most students. Many people, both educators and non-educators,
believe that composition courses play an extremely important
part in the educational process. These people argue that
composition courses develop writing skills which will serve
the student well both in other courses and in the world of work.
However, in the last few years, composition courses have been
severely criticized because, the critics assert, they do a
poor job of teaching students to write. Some people insist
that the problem is one of relaxed standards in high school
composition courses. These people also insist that the effec-
tiveness of high school composition courses could be increased
if the courses made greater demands on the student, thus mak-
ing it more difficult for the student to earn passing marks or
grades. Other people assert that composition courses in high
schools are not related to the world outside the classroom.
According to these people, composition courses should be abolished
because they have no practical value.

In a multi-level essay (that is, an extensive and detailed
essay), argue objectively for one of the above three points
of view. Your argument should be well organized and easy to
follow. It should be unified and complete, and it should be
free of all logical fallacies or errors in reasoning. Support
for your position should come from your knowledge of the problem
and its implications, and that support should be presented ob-
jectively without the use of first-person pronouns. Before
you begin to write, you may want to explore questions of your
own or to explore questions such as these: Is there a

relationship between what the student does in a high school
composition course and the world outside the classroom? Do
high school composition courses have a value apart from the
teaching of writing? What standards should be used in assess-
ing student progress in high school composition courses? In
what ways are composition courses practical? impractical?
What should the goals of a high school composition course be?
Why are some high school composition courses effective? ineffec-
tive? Is writing related to other language skills? What role
should composition courses have in a high school curriculum?
Is knowing how to write well vital to the future employment
of high school graduates? vital to the future employment of
some but not of others?

Administration of the Test Instruments. These sets of

writing topics were used within the pretest-posttest design.

Although it was believed that the two topics in either set

were roughly comparable with respect to levels of difficulty,

it could not be determined in advance whether administering one

topic in either set as a pretest topic and the other as a

posttest topic would bias the results. If one topic in a set

were more difficult for the students to write on than the other

and if that topic were administered only as a pretest, then the

resultant change scores across time would likely have been in-

flated. Such inflation could suggest that the variable being

tested in a given comparison had a more powerful effect on

student performance than it actually did. Conversely, if the

two topics in a given set were not of comparable difficulty

and the easier topic were administered only as a pretest topic

and the more difficult one only as a posttest topic, then those

resultant change scores could also have been misleading. In

that event, the results may have indicated that no positive

change had occurred as a function of the instructional treat-

ment or the curricular design when, in fact, the absence of

positive change would have been an artifact of administering
the more difficult topic as a posttest topic only.

To guard against these and other possible sources of bias,
we administered one topic in a set as a pretest to one section
in each half of each of the five principal comparisons and the
other topic as a pretest to the other section. For the posttest
essays, the process was simply reversed. Table 2.1 shows the
way the topics were administered within each of the five princi-
pal comparisons. The section numbers are those assigned by the
investigators, and the brief descriptions are provided to help
distinguish between the sections within each of the five princi-
pal comparisons. This same procedure was followed in the adminis-
tration of the McGraw-Hill tests, with those students writing on the

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Insert Table 2.2 about here.

A_1 topic as a pretest completing Form A of each test and those
writing on topic B_1 completing Form B of each test as a pretest.
For the posttest the forms were reversed. Such stringent con-
trols against one writing topic within a given pair of topics,
or one form of a McGraw-Hill test, biasing the derivative com-
parisons could not, of course, be maintained for the derivative
comparisons. The various sections of E 306 involved in the de-
rivative comparisons are specified in Table 2.2; and if Table 2.2 and
Table 2.1 are viewed together, this lack of control over the writing
topics and the forms of the McGraw ; 1 tests as far as the derivative

comparisons are concerned can be observed. It is also important
to reiterate that while the teacher variable was rigorously controlled

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Insert Table 2.2 about here. $\int$

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in the five principal comparisons, such control was not possible
in the five derivative comparisons.

Sample Selection. Although pretest and posttest essays for
each set of topics were collected in the manner indicated by
Table 2.1 for each of the approximately 25 students in each of
the 20 sections, extremely limited financial resources precluded
evaluating all of the 2,000 essays (four essays each from each
of 500 students) collected. Thus before holistic evaluations
of the essays took place and before syntactic analyses were
performed on them, a random selection of nine students from each
of the 20 sections was made f' owing methods outlined by
Plutchik (1974) and others for the generation of random num-
bers from a finite set. Although complete sets of essay data
were available for these 180 students, complete sets of objective
test data were not available for these students. Complete pre-
test and posttest data for the McGraw-Hill Writing Test were
not available for 15 of the 180 students; and complete pretest
and posttest data for the McGraw-Hill Reading Test and the
Daly Miller Writing Apprehension Test were not available for

21 of the 180 students. These missing data sets were spread

across the 20 E 306 sections used in the present study.

2.3 Holistic Evaluation Procedures

Preparing the Essays for Holistic Evaluation. Prior to

submitting the 720 essays to holistic evaluation, all identi-

fying marks were either removed from or blacked out on the

essays. Such marks included the student's name, the date,

the E 306 "unique" number, the teacher's comments, and the

teacher's grade. This procedure was necessary to insure the

anonymity of the individual students and to avoid biasing the

raters who would score the essays. This process was, in many

cases, a very time-consuming one because many of the papers

had been heavily annotated by the respective teachers. Each

of the 720 essays was then coded on each page with a six-digit

number, the meaning of which was known only to the investigators.

This code number allowed the investigators to identify the sec-

tion from which a given essay had been selected, the student

within the section who had written the essay, the time of test-

ing (whether pretest or posttest), and the essay topic. Thus

the code number "120664" would indicate to the investigators

that the essay come from section 12 (which was itself a code for

a give "unique" number), that it was written by student "6" in

section 12, that it was a posttest essay (if fifth digit in the

code number had been a 5, the essay would have been a pretest

essay), and that it was written on the B_2 topic (as the sixth

digit, $1 = A_1$, $2 = B_1$, $3 = A_2$, and $4 = B_2$). After all identi-
fying marks had either been removed from or blacked out on
each essay and after all 720 essays had been coded as indicated
above, the essays were photocopied before being submitted to
single-impression holistic evaluations.

Single-Impression Holistic Evaluation. This type of holis-
tic evaluation is a method developed by the Educational Testing
Service (ETS) for assessing large numbers of students writing
samples relatively quickly and has been proffered as the most
reliable and least costly method developed to date for assessing
student writing. In single-impression holistic evaluation, pre-
test and posttest essays written by the same group of subjects
on like or comparable writing topics are pooled. Raters are
not informed which essays were written as pretest measures and
which were written as posttest measures. Holistic evaluations
are preceded by intensive training sessions. These are probably
an integral part of holistic evaluations. During these sessions,
raters read essays written on the same topics as those to be
evaluated, rate the essays, and then compare ratings. More
papers are read and rated, and the ratings compared among raters.
This process continues until all raters are rating virtually
every paper the same way. The process itself palces a great
deal of pressure on dissenting raters, those whose ratings de-
part markedly form the majority rating assigned to a particular
paper. Typically, holistic rating sessions employ either a
four-point, a six-point, or an eight-point scale, with the

number "1" assigned to the essays of the lowest quality and the highest number assigned to the essays of the highest quality. Because the larger the scale the more difficult it becomes to achieve acceptable inter-rater reliabilities (see below), we employed a four-point holistic scale in the present study.

In holistic evaluation, raters are forced to read essays very quickly and to make impressionistic judgments as to the relative quality of an essay, presumably not allowing particular features to be weighted more heavily in their decision-making processes than other features. For example, raters are discouraged from assigning a low score to an essay simply because the writer did not know, say, how to avoid comma splices or how to make pronouns agree with their antecedents in number. Rather, the emphasis is always on the "total impression," the holistic impression, of the essay. Raters are also instructed and trained to ignore handwriting and spelling errors, a problem which often takes some time to overcome in training sessions.

Another difficulty encountered in holistic training sessions and in holistic rating sessions (if the training sessions are inadequate) is the tendency of raters to equate holistic scores with grades. Holistic scores differ from grades in at least three important ways. First, grading can be described as applying criteria that have been abstracted from some standard of performance not derived from the particular essays being graded but rather imposed upon those essays. These external criteria have, of course, been shown to differ from one grader to the

next. If holistic raters were allowed to treat holistic
scores as though they were grades, each rater would probably
bring a different set of internalized and hierarchial criteria
to the evaluation. In holistic evaluation, criteria must be
generated from or identified in the referent group being
evaluated in order to achieve agreement among raters. That is
to say, during the training sessions raters must be exposed
to the range in quality of the set of papers to be submitted
to holistic evaluation. From these representative papers (which
in the present study were drawn from the 1,285 papers not
selected for evaluation), the raters extract the criteria which
apply to that set of essays. Thus holistic scores are always
made to be relative to only those papers being evaluated.
Second, grading techniques are seldom, if ever, applied to a
set of essays consisting of essays separated in time by several
months. Third, in holistic evaluation, where pretest and posttest
essays are pooled, scores should be distributed across each
scoring category, something which seldom occurs in classroom
practice. By attempting to force essays into each available
category, it becomes possible to achieve the spread of scores
required to show that X_1 number of essays were better than X_2
number of essays. When a given holistic session is completed,
approximately 50% of the pooled pretest and posttest essays
should fall above the mean and 50% should fall below the mean.
If a given instructional treatment had any positive effect on
student writing performance, more posttest essay scores should
appear above the mean for that group of students than below.

The holistic rating sessions employed in the study being reported here consisted of six to ten raters, depending on the particular rating session. The photocopied and coded essays for each set of essay topics were pooled and randomly sequence' with regard to E 306 section, time of writing (pretest or posttest), and topic within essay set. The essays were then divided into stacks which totalled twice the number of raters involved in a given rating session. Each stack was then read and scored by two raters. Neither rater reading a given stack of essays had knowledge of the scores assigned those essays by the other rater. Because a four-point scale was employed with two raters for each essay, the summed scores for a given essay ranged from two to eight. When the two scores assigned a given essay differed by two or more on the four-point scale, the essay was submitted to a third reading by a third rater who had no knowledge of the scores assigned by the previous two raters. The third rater's score was then added to the previous rating to which the third score came closest. In cases where a two-four split or a comparable split appeared after the first two ratings and the third rating fell between the two earlier scores, the scores more distant from the middle were used. For example, if an essay had been rated "1" and "3" by the first two readers and "2" by the third reader, the "1" and the "2" were summed. Interrater reliabilities were computed to determine with what consistency the raters assigned holistic scores to the essays. Using a technique described by Ebel (1951), we computed separate reliability coefficients for the holistic scores assigned to the A_1B_1 pretest essays, the A_1B_1

posttest essays, the A_2B_2 pretest essays, and the A_2B_2 post-
test essays. These coefficients were found to be 0.76, 0.78, 0.82,
and 0.84, respectively.

The Distribution of Holistic Scores by Scoring Category.
As was pointed out above, a four-point scale was employed in
the holistic rating sessions and scores from two raters were
used to arrive at a summed score recorded for each essay rated.
The distribution of scores within the four scoring categories
appears in Table 2.3 and Table 2.4. Table 2.3 reports on the
actual number of scores in each category and Table 2.4 converts
those data to percentages of total scores awarded. Because
two such scores were used for each of the 720 essays rated, the
number of scores included in Table 2.3 is double the number of
essays rated.

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Insert Table 2.3 about here.

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Insert Table 2.4 about here.

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When the scores (with a possible range of one to four)
assigned a particular essay are summed, the number of scoring
categories increases from four to seven and a scoring range
from two to eight results. Table 2.5 and Table 2.6 present the
distribution of these summed scores assigned in the holistic

rating sessions to the 720 E 306 essays. These same data, con-

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Insert Table 2.5 about here.

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verted into percentages of total scores in each scoring category
(2 through 8), are presented in Table 2.6. As with Table 2.3

Insert Table 2.6 about here.

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and Table 2.4, Table 2.5 and Table 2.6 give some indications
of improved writing performance in the 20 F 306 sections during
the Fall Semester of 1978. If we ignore the scores falling mid-
way (that is, those scores in scoring category 5) between the
extremes of scoring categories 2 and 8, we find that 45.5% of
the scores on the A_1B_1 pretest essays fall into the low range
(scoring categories 2, 3, and 4) and that only 22.8% of the scores
fall into the high range (scoring categories 6, 7, and 8). When
the A_1B_1 posttest essays are viewed in the same way, we observe
that a significantly smaller percentage, 39.9% as compared to
45.5% of the essays fall into the low range and that a significantly
higher percentage, 37.8% as compared to 22.8%, fall into the high
range. This difference in percentages, again, indicates that
the writing performances, as measured by the A_1B_1 writing topics,
of some of the 180 E 306 writers studied were better at the end
of the semester than at the beginning. When we examine the dis-
tribution of pretest and posttest scores on the A_2B_2 writing topics,
we note a greater improvement over the course of the semester.

Of the A_2B_2 pretest scores, 51.6% fall into the low range and 26.1% fall into the high range. Of the A_2B_2 posttest scores, only 37.2% fall into the low range while 44.9% fall into the high range. If we pool the A_1B_1 pretest scores and the A_2B_2 pretest scores and compare their distribution with that of the pooled A_1B_1 posttest scores and A_2B_2 posttest scores, we get some indication of the overall change in writing performance, as measured by the two sets of essay topics, for the E 306 students involved i the present study. Of the pooled pretest scores, 48.6% fell into the low range and only 24.5% fell into the high range; but of the pooled posttest scores, only 38.1% fell into the low range while 41.3% fell into the high range. Thus for the pooled scores we see that over the course of the semester 10.5% of the E 306 students studied moved out of the low range of writing performance while 16.8% moved into the high range.

While these percentages give a very general impression of improvement in writing performance across the time of one semester for all 180 E 306 students involved in the study, our principal concern is the instructional variables which caused the most improvement or which affected writing performance adversely. The data in these four tables are presented simply to indicate the workings of holistic evaluation procedures. In subsequent chapters of this report, we will focus directly in the apparent causes for the improvement suggested by these four tables.

2.4 Syntactic Analyses of the E 306 Essays

The single-impression holistic evaluations of the 720 E 306
essays provided an indication of the quality of each essay in
relation to the referent group of which that essay is a part.
But holistic scores indicate very little about the specific fea-
tures of essays which can and do change across time. Although
we would have liked, for example, to have submitted all 720
E 306 essays to analyses of semantic and lexical features and to
analyses of developmental and organizational patterns, such analyses
either required much more money than was available to us or required
analytic techniques much more sophisticated and efficient than
those which have been developed to date. We did, however, examine
certain features of all 720 essays which were submitted to holistic
evaluation, partly because some of those features have been shown
to predict writing quality and partly because the analyses performed
would-allow us to place the changes observed in the E 306 essays
in the context of several previous studies.

In Chapter 3 of this report, we review the literature relevant
to our analyses of the syntactic features of the 720 E 305 essays.
Since most of the syntactic analyses we performed are based on
the total number of words in an essay, it was necessary, first,
to count all the words in each of the 720 essays which contained,
on the average, 433.91 words each. The rules observed in count-
ing the words in each essay were those observed in the Miami
University Sentence-combining experiment (Morenberg, et al., 1978)
and in Faigley's (1979 b,c) study of the effects of generative
rhetoric on writing performance.

CHAPTER 3

SOME FEATURES OF "HIGH" AND "LOW" QUALITY
E 306 ESSAYS

A question of continuing interest to researchers in writ-
ing is what internal characteristics distinguish essays ranked
high and low according to overall quality. Research at the
college level has for the most part taken two approaches to
this question, examining errors (e.g., Shaughnessy, 1977) and
syntactic features (e.g., Gebhard, 1978). Neither of these
approaches has been entirely satisfactory. Maimon and Nodine's
sentence-combining experiment (1978) suggests that, as is
true for the acquisition of other skills, certain kinds of
errors accompany certain stages in learning to write. The
underlying causes of error are often complex and difficult to
trace. Consequently, researchers can conclude little more
than what is obvious: low-rated papers usually contain far
more errors than high-rated papers. Likewise, Gebhard found
that with few exceptions the syntactic features of high- and
low-rated essays written by college students are not clearly
differentiated. Gebhard saw no specific directions in her
data for teaching the improvement of written syntax. Another
approach to distinguishing essays rated high and low in quality
is by content analysis. Lunsford (1979) found that essays
rated low in quality typically contain more first- and

second-person pronouns than high-rated papers. Lunsford's
findings tend to support the more general observation that
college freshmen with underdeveloped writing skills show
more evidence of cognitive egocentrism than their counter-
parts with more highly developed writing skills (cf. Barritt
& Kroll, 1978; Lunsford, 1977).

The purpose of the present chapter is to suggest some
particular ways in which the better E 306 essays differ from
the poorer ones. This purpose, it is hoped, will benefit those
concerned with matters pertaining to curricular and instructional
design for E 306 courses, providing an approximate profile
of the best and the poorest incoming E 306 freshmen writers.
This "profile" will be based on a number of detailed analyses
--an error analysis, an analysis of certain syntactic features,
an analysis of the frequency of use of first- and second-person
pronouns, and an analysis of cohesive devices. Such detailed
analyses are, of course, both extremely tedious and time-
consuming, requiring that the number of writing samples be
severely limited. Because of the necessarily limited number
of writing samples examined in such detail, we can only hope
that the analyses reported here are generalizable to the E 306
population at large.

From the pretest essays we selected five of the poorest
essays written on the A_1 topic and five of the best written
on the same topic. "Poorest" and "Best" were determined by
the scores assigned the respective essays during one of the
holistic evaluation sessions. The five "poorest" essays all

received summed scores of 2, while the five "best" essays received summed scores of either 7 or 8. Descriptive data focusing on length factors of the two sets of essays appear in Table 3.1

Insert Table 3.1 about here.

As Table 3.1 indicates, the "high quality" essays were more than twice as long as the "low quality" essays, whether viewed in terms of average length in words, sentences, T-units (according to Hunt [1965] who introduced the term, a T-unit is a main clause plus all subordinate elements attached to or embedded in it), or clauses. We will have many occasions in the pages which follow to discuss the importance of the differences in length between the "low" and "high" quality essays, between the "poorest" and the "best" essays.

The ten essays represented in Table 3.1 were analyzed in considerable detail in order to identify some specific differences between the "best" and "poorest" essays in the sample. By identifying a range of features and by suggesting how these features relate to writing quality, we will be better able to recommend certain instructional techniques and practices which should help writers of "poor quality" essays to become more like their counterparts who write essays of much higher quality. In this analysis, we focus on the occurrence of usage "errors," on respective levels of syntactic complexity,

on the frequency of first- and second-person pronouns, and on text cohesion. Each of these topics will be addressed separately in the pages which follow.

3.1 Error Analysis of E 306 Essays

The analysis of usage "errors" in student writing is important for several reasons. First, usage "errors" or "mechanics", as they are often called, are frequently cited by educators outside English departments, by the business community, and by the public at large as evidence of a decline in the writing abilities of college students and graduates alike. Second, teaching students to write using the dialect of standard Written English appears to be one of the many functions expected of service-oriented composition courses and programs. Third, several members of the English faculty at the University of Texas have cited "mechanics" as a major problem among English 306 students. Fourth, problems in usage or mechanics frequently point to writing problems of a more severe nature.

Following procedures comparable to those used recently in a study of the writing of entering freshmen at SUNY-Buffalo (Cooper, et al., 1979), we concentrated on three categories of "error," addressed below under the headings of Punctuation, Grammar, and Spelling. Before presenting the results of our analyses of each class of errors, we will indicate the parameters of these classes, providing examples of each type of error in each class from the essays we analyzed.

Punctuation.   Punctuation errors were broken down into
two subclasses, one including the punctuation expected at the
ends of sentences, and one including punctuation within sen-
tence boundaries.

Errors in sentence end-stop punctuation were typically
of two kinds, the comma splice and the fragment.

The comma splice occurs when a writer joins two independent
clauses with a comma, omitting the necessary coordinating con-
junction.   The following group of words contains a comma splice.

(1)   Some behavior is repressed, not admitted to the

consciousness, often this causes mental problems.

According to composition handbooks, the comma appearing between
"consciousness" and "often" is not sufficient to join the pre-
ceding and following independent clauses.   If the sentence
were punctuated "correctly," "often" would need to follow
the coordinating conjunction and or a semi-colon which would
function as a period.

The fragment, on the other hand, fails to meet one or
more of the minimum requirements of sentences.   Typically, a
fragment either (1) lacks a finite verb in the predicate
position or (2) is preceded by a subordinating conjunction
such as although, when, because, or if.

Consider the following two series of words, both punctu-
ated as sentences by E 306 students.

(2) Not because of the fact that he is, in reality,
that kind of person, but because that is the way
the situation dictates it.

(3) The main one being the need to be accepted.

In example 2, both of the long clauses are governed by the
subordinating conjunction "because," thus making them sub-
ordinate to some independent clause not included between the
initial capital letter and the terminal period. In example
3, "being" is not a finite verb, thus leaving the subject,
"one," of the series without a grammatically acceptable predicate.

In addition to the comma splice and the fragment which
result from "errors" in punctuating sentence boundaries, other
major punctuation errors occur within sentences themselves.
Although writers have many opportunities for incorrectly
punctuating within sentences, among E 306 students a few types
of "within sentence" punctuation errors predominate. These
errors may result from the writer either including unnecessary
punctuation or omitting the necessary punctuation. A few typical
examples from the student essays will illustrate.

(4) A friend of mine, for example, acts, so shy people
think he is the quite [sic] type.

(5) For instance, the love, that all of us feel at one
time in our lifes [sic], has the ability to bring
two people very close together. . . .

(6) However it is obvious that human behavior is constantly
changing. . . .

In example 4, the comma after "acts" is superfluous, serving no function whatsoever. In example 5, the relative clause, "that all of us feel at one time in our lifes," is punctuated as though it were a non-restrictive clause when, in fact, it is a restrictive clause and should thus not be set off with commas. In example 6, the writer has failed to set off with a comma the introductory conjunctive adverb, "however," as handbooks of usage direct.

Grammatical Errors. Of the many possible types of grammatical errors, six appear frequently in student writing. These errors are errors in verb tenses, errors in number agreement between a verb and its subject, errors in pronoun reference, errors in pronoun number agreement, and errors in modification in which a modifier is either misplaced or left dangling with no noun-actor for it to modify. Again, examples from the students' papers will help illustrate these types of grammatical error.

(7) Love, which is one of the rarest emotions know to us, is constantly a topic of are [sic] thoughts.

(8) Therefore, society and culture encourages this role-playing game.

(9) If you meet a person and they are really nasty to you for no apparent reason yo' will no doubt have harsh feelings toward that person.

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(10) By allowing extremely violent television shows
and movies it can be expected that our national
crime rate will increase. . . .

In (7), the present tense "know" appears where the past
participial form of the verb would normally appear; and in
(8) a singular verb, "encourages," is incorrectly supplied
for a plural subject, "society and culture." In (9), the
plural pronoun "they" is used to refer to a singular entity,
"person." And in (10), "By allowing extremely violent tele-
vision shows and movies" stands next to an expletive "it"
which cannot perform the action indicated by the verbal "allowing,"
thus leaving the entire introductory participial phrase "dangling"
apart from an actor capable of "allowing."

Spelling Errors. Finally, we counted misspelled words. As
might be expected, both the "high" quality and the "low" quality
writers experienced the most difficulty with homonyms--words
sounding the same but having different meanings--such as our-
are, there-their, their-they're, there-they're, and it's-its.
Two other particularly troublesome sets, though not strictly
homonymous, were then-than and affect-effect. In arriving at
the number of misspelled words in each paper we counted a
misspelled word only once in any given paper, even though that
word might have been misspelled several times by the writer.

Comparison of "High" and "Low" Quality Essays. Because
there was considerable variation in the lengths of the essays

in both the "high" quality set and the "low" quality set,
it was impossible to make any comparisons between the two
sets without some common denominators. We chose two
common denominators, words and T-units, for each set of five
essays. By dividing the number of errors of each type for
a given set of essays into the total number of words of the
essays in that set; we were able to calculate the frequency
of occurrence, in words, for each error type. Similarly, by
dividing the number of errors of each type into the total
number of T-units of the essays in a given set, we were able
to calculate the frequency of error in terms of T-units. The
results of these calculations appear in Table 3.2 and Table 3.3.

Insert Table 3.2 about here.

Insert Table 3.3 about here.

Table 3.2 and Table 3.3 present the same set of raw data
(the number of usage errors) in two different ways, one in
terms of the mean number of words separating errors of various
types and one in terms of the mean number of T-units separating
the errors of various types. If we look at the frequency of
occurrence of all errors in terms of words and T-units, we see
that the "low quality" essays exhibited an error of some type
nearly three times as often--one every 29.39 words as opposed

to one every 87.24 words or one every 2.15 T-units as opposed
to one every 5.7 T-units--as the "high quality" essays. Some
types of error, of course, appeared more often than others.
For example, an error in end-stop punctuation, resulting in
either a comma splice or a fragment, occurred nearly eight
times as often in the "low quality" essays as in the "high
quality" essays. With regard to this particular type of
error, it is important to note that the fragment occurred more
often in the "high quality" essays than it did in the "low
quality" essays. However, in every case of a fragment in a
"high quality" essay, the fragment was the result of the writer
creating a long terminal sentence modifier but failing to at-
tach it to the preceding main clause with a comma. It seems
to us that this type of punctuation error could result from a
writer attempting to manage a complex syntactic structure
which the writers of the "low quality" essays seldom attempted.
This alone should suggest that any approach to composition which
stresses error reduction primarily may discourage students from
attempting to manipulate complex syntactic structures with
which they are not altogether comfortable. The other type
of punctuation error we examined, that involving either the
omission of necessary punctuation or the inclusion of unnecessary
punctuation, also points to a significant difference between
the two groups of writers. Whereas the group of "low quality"
writers simply seemed not to understand the principles of
within-sentence punctuation and thereby exhibited many different
such errors, most of the within-sentence punctuation errors of

the "high quality" group resulted from the omission of commas
after initial conjunctive adverbs, words which do not appear
very often in the "low quality" essays. Among the grammatical
errors, verb tense errors appear not to be a major problem
for either group, nor does the occurrence of misplaced or
dangling modifiers present much cause for alarm. Pronoun
reference and pronoun agreement were, however, something of
a problem for both groups of writers, even though a pronoun
error occurred only about two and one-half times as often in
the "low quality" essays as in the "high quality" essays. Yet
there were some noticeable differences in the kinds of pronoun
errors most frequently observed in both groups of essays.
Most of the "errors" observed in the "high quality" papers
were errors in pronoun number agreement. (We hesitate to label
these as errors because of their frequent use in spoken English.)
In the "low quality" essays, the pronoun errors included ones
involving ambiguous referents as well as number agreement. If
we were asked to speculate about the correlation of pronouns
with ambiguous referents to writing quality, we would suggest
that such errors detract from the overall clarity exhibited
in a piece of writing.

It would not be appropriate to end this section on error
analysis without some attempt to suggest how these data, col-
lected from beginning E 306 students at the University of Texas,
relate to data collected from groups of beginning college fresh-
men at other universities. Although few such error analyses
were available to the investigators, the two studies which

were available that do report error analyses in detail pro-
vide the bases for some interesting comparisons.

In order to make these comparisons we pooled error-data
from the "high quality" and "low quality" E 306 essays in
order to extrapolate error frequencies of various types for
an "average" beginning E 306 student. The results of this
pooling appear in Table 3.4.

Insert Table 3.4 about here.

Given these frequencies of error, what can be said about the
error-tendencies of beginning E 306 students? The first point
to note is that our "hypothesized" "average" E 306 student
commits punctuation and spelling errors at a rate more than
twice as great as the rate with which he/she makes grammatical
errors. The difference between these rates of punctuation-
error frequency and spelling-error frequency on the one hand
and grammar-error frequency on the other hand probably lies
in the linguistic difference between spelling and punctuation,
on the one hand, and grammar, on the other. Spelling and
punctuation are particular to written language and are learned
relatively late, while grammar--"good," "standard," "sub-
standard," or otherwise--is an inseparable part of language
itself, something every person has before he/she attends his/
her first kindergarten class. Punctuation and spelling,
properly speaking, are writing skills, artificial adjuncts

to language usage, and as such develop much more slowly and much later. Beginning E 306 students have been speaking the language for some seventeen or eighteen years, but they have been aware of the differences between oral and written discourse for fewer than half of those years and have perhaps never been required to write regularly at any time during their lives. By the time one reaches the age of eighteen, he/she has in all probability already produced oral discourse in greater quantity than he/she will ever produce written discourse.

These differences in error frequencies or rates are, of course, also reflected in the ratio of error types to the total number of errors observed in the sample, ratios which can be expressed as percentages of the total errors. Of all the errors observed, 41% were punctuation errors and 39.8% were spelling errors. Thus nearly 81% of all errors committed in the written discourse sample were errors that would not have figured at all in the oral discourse of these same students, thus again suggesting that these E 306 students had a basically good command of important matters of usage.

But how do these E 306 students compare with other groups of beginning college freshmen? Witte and Sodowsky (1977) did a similar analysis of the written discourse produced by beginning college freshmen at Oklahoma State University. For this population, which in 1976 had mean ACT English, Mathematics, and Composite scores of 18.3, 21.3, and 20.2, respectively, Witte and

Sodowsky reported that punctuation errors of all types
occurred on the average once every 91.8 words and grammar
errors of all types once every 7$^?$ words. Compared to the
E 306 freshmen in the present study, the OSU students were
considerably less proficient in matters of usage, committing
punctuation errors with a 31% greater frequency than the UT
students and grammatical errors with a frequency approximately
75% greater than that observed in the writing samples col-
lected from the E 306 students. It should, however, be noted
that of the OSU population about 18% were "developmental" or
"remedial" students, students who would be classified as "pro-
visionals" at the University of Texas. There were no "provisional"
students in the University of Texas population we studied.

In a study of SUNY-Buffalo beginning freshman writers
(who, incidentally, were drawn from the top 12% of high school
graduating classes), Cooper, et al. (1980) report on an error
analysis of two sub-groups, those writing "high quality" es-
says and those writing "low quality" essays as determined by
a holistic evaluation similar to the ones employed in the
present study. To draw comparisons between that group and the
E 306 student writers, we summed the results for the two SUNY-
Buffalo sub-groups and divided by two. Because the results
for the SUNY-Buffalo analysis are reported in terms of errors
per 1000 words, we converted the E 306 data to that form, as
shown in Table 3.4. As Table 3.4 indicates, for the E 306
students 7.42 punctuation errors occurred for every 1000 words,
or about three punctuation errors per "average" freshman essay.

For the SUNY-Buffalo students, 9 punctuation errors occurred
for each 1000 words, or 21% more often than for E 306 students.
A similar difference between the two groups is observed when
the respective occurrences of grammatical errors are compared.
The SUNY-Buffalo writers committed, on the average, 4.5 gram-
matical errors for every 1000 words, while the E 306 students
committed 3.49 grammatical errors per 1000 words, a frequency
29% smaller than that of the SUNY-Buffalo writers. So, too,
with spelling: the SUNY-Buffalo freshmen misspelled about
9.5 words per 1000 written, while the E 306 students mis-
spelled only about 7.2 words for each 1000 produced. When all
three categories of error are collapsed for each group, we
find that the SUNY-Buffalo freshmen committed about 23 errors
for each 1000-word span of text written, while the E 306 students
committed 18.12 errors for a text of the same length. This
higher frequency of error among SUNY-Buffalo students may, how-
ever, be attributed to the fact that they tended to write more
complex syntactic structures, a matter discussed in some de-
tail in the following section of this report. Nevertheless,
the E 306 writers, half of whom were judged to be "high quality"
writers and half of whom were judged to be "low quality" writers,
produced approximately 27% fewer errors per 1000 words of text
than did the beginning college freshmen at SUNY-Buffalo.

Although the error analyses for these groups of beginning
college writers--the E 306 students, the SUNY-Buffalo students,
and the Oklahoma State University students--are not strictly
comparable because the writing samples were collected under

differing conditions on different writing topics and be-
cause the procedures for collecting the writing samples and
for counting the errors may have differed in some ways not
reported, it is reasonable to infer that the E 306 students at
the University of Texas whose writing we examined hold their
own quite well against beginning college freshmen at other
universities. And this speaks well of the University of Texas
freshman class at large because, it must be remembered, nearly
30% of each freshman class at the University of Texas is given
advance standing credit for E 306.

3.2 Syntactic Analysis of E 306 Essays

As Faigley (1979d; in press) and Williams (1979) have
argued, "syntactic complexity" (or "maturity" or "fluency")
is in some sense a name in search of a concept, primarily be-
cause it is impossible to say with much confidence what specifi-
cally the indices most frequently used to calculate the phenome-
non measure. It would appear that to a great extent and to
many researchers "syntactic complexity" is whatever the indices
used to measure it measure, a circular and operational definition
not particularly useful in empirical research, if empirical re-
search is ever to advance theory. Yet, on a very general level,
"syntactic complexity" seems somehow to refer to the use or
manipulation of syntactic structures in such a way that a writer
is able to say more in fewer words. Thus in a very real sense
"syntactic complexity" presupposes some notion of semantic
density in written discourse. However, the relationship between

the "syntactic" and the "semantic" has not been explored or applied in empirical research, thus making many of the results of empirical research in this area of limited value to other researchers or to teachers of writing.

While some researchers have focused their criticism on the meaning of "syntactic complexity," others have raised issues related to the indices most frequently employed to measure it. For example, Brereton, et al. (1979), have raised questions focusing on the cross-sample reliabilities of varying counting procedures, thereby suggesting that results obtained in one study may not be usefully compared to results obtained in another. Raising a different issue, O'Donnell (1976) has pointed out that "there are no data" to suggest how consistently the measures or indices most commonly employed in empirical research measure the writing of individuals in different situations. Witte, together with two colleagues, has attempted to explore the implications of O'Donnell's observation and addressed, both in terms of groups and individuals, the question of the stability of these indices within and across different modes of written discourse (see Witte and Davis, 1976; Witte, 1979; Witte and Davis, 1980 and in press). To some extent, the research of Witte and the two Davis's focuses on questions implicit in a large number of previous studies-- e.g., Seegars (1933), Frogner (1933), Anderson (1960), Marckworth and Bell (1967), Johnson (1967), Veal and Tillman (1971), San Jose (1972, 1974, 1978), Perron (1976a, 1976b, 1976c, 1977), and Crowhurst (1978, 1979)--all of which point to considerable syntactic variation across discourse of different kinds.

These questions and issues notwithstanding, O'Donnell (1976) and (Hunt, 1964, 1970, 1977) present evidence suggesting that some syntactic indices can be used to track gross normative changes in syntactic manipulation for various populations. Whatever their strengths and weaknesses, different indices of syntactic complexity have been used regularly to study the oral and written discourse of students since LaBrant (1933) published her study.

Most recently, a large number of researchers have adopted Hunt's (1965) "syntactic maturity" model and its corresponding set of indices. Hunt himself posited the use of those indices as developmental or normative measures. However, the model Hunt espouses--with its range of "complexity" spanning from the writing of elementary children to that of professional writers who had published in Harper's and Atlantic--has been interpreted to mean that some kind of equivalence exists between syntactic maturity or complexity, defined in terms of Hunt's indices, and writing quality. Such is not an unreasonable interpretation, given Hunt's emphasis (1965, 1970) on paraliterary discourse at one end of his "developmental" continuum. Hunt's model and its continuum have recently been challenged on theoretical grounds by Kinneavy (1979) and on empirical grounds by Nold and Freedman (1977), Witte (1978), Marzano (1976) and Faigley (1979c).

Hunt's model of syntactic maturity or complexity is based on analyses of written discourse, analyses which use five measures or indices. Hunt and others--e.g., O'Donnell, et al.

(1967), Witte and Sodowsky (1978), Sodowsky and Witte, (1978), Stewart (1978a), and Cooper, et al. (1979)--have used these as developmental indices of syntactic complexity. Others-- e.g., Mellon (1969), O'Hare (1973), Combs (1976), Ney (1976), Mulder, et al. (1978), Daiker, Kerek, and Morenberg (1978; Merenberg, Daiker, and Kerek, 1978), Faigley (1979b, 1979c), and Stewart (1978b)--have used one or more of these five measures in pedagogical research to measure the effects of certain types of writing instruction on the writing behaviors of students from the elementary to the college level.

Although there remain several troubling issues and many unanswered questions in the research on the development of syntactic complexity or maturity, it will be useful to compare our "high" and "low" quality E 306 writers to writers of different ages studied by other researchers. In this comparison, we will focus attention on gross measurements of syntactic manipulation--mean T-unit length, mean clause length, mean number of clauses per T-unit, mean number of T-units per sentence, and mean sentence length--and on the occurrence of unrestricted sentence modifiers in the terminal and the medial positions in the sentence. The gross measures are those posited by Hunt, while the others are based on the theoretical or speculative work of the late Francis Christensen (1967) and the empirical work of Nold and Freedman (1977) and Faigley (1979a, 1979c).

Mean T-unit Length. Hunt (1965) introduced the T-unit, or "minimal terminable unit," as a measure of syntactic maturity.

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A T-unit is one independent (or main or base) clause plus
all the subordinate elements attached to or embedded in it.
According to Hunt, such a measure or index is needed because
sentence length varies so greatly within and across writers
punctuation skill or writing style. The following according to
passage, punctuated as a single sentence by one of the elementary
students whose writing Hunt (1965, p. 20) studied, will illustate
the unreliability of mean sentence length as a measure of syn-
tactic maturity or complexity and will introduce Hunt's alterna-
tive index, mean T-unit length.

> I like the movie we saw about Moby Dick the white
> whale the captain said if you can kill the white
> whale Moby Dick I will give this gold to the one
> that can do it and it is worth sixteen dollars they
> tried and tried but while they were trying they
> killed a whale and used the oil for lamps they al-
> most caught the white whale.

Obviously, this is not a sentence that any teacher of college
writing would like to receive from a student. But it does
illustrate the unreliability of sentence length as an indicator
of maturity or complexity in syntactic manipulation. Even if
the several run-on, or fused, sentences were separated with
semi-colons, thereby making the sentence conform better to
acceptable punctuation practice, the problem remains. But if
the passage were segmented into T-units, or "minimal terminable
units," we would begin to get some indication of the syntactic
maturity or complexity exhibited by it.

I like the movie we saw about Moby Dick the
white whale // the captain said if you can kill
the white whale Moby Dick I will give this gold to
the one that can do it // and it is worth sixteen
dollars // they tried and tried // but while
they were trying they killed a whale and used
the oil for lamps // they almost caught the white
whale. //

The units into which this passage is divided are, according to
Hunt, "minimal as to length"; and "each would be grammatically
capable of being terminated with a capital letter and a period"
(1965, p. 21). Mean T-unit length itself is calculated by
dividing the total number of words in a passage, in this case
67, by the total number of T-units, in this case 5. Thus
the mean T-unit length for this passage is 13.4 words.

.T-units can be described with reference to the four
traditional sentence types--the simple, the compound, the
complex, and the compound-complex. According to Hunt's defini-
tion of the T-unit, simple and complex sentences would each
have one T-unit, but compound and compound-complex sentences
would each have at least two T-units. The following sentences
will illustrate.

Simple Sentences

I bought an apple. //

Having eaten my potatoes, I ate an apple. //

Complex Sentences

When I had eaten my potatoes, I ate an apple. //

I like the movie we saw about Moby Dick, the
white whale. //

Compound Sentences

I ate my potatoes // and then I ate an apple. //

Jeff brought home a school assignment, // but he
went to Barry's house to play. //

Compound-Complex Sentences

After I ate my potatoes, I ate an apple, // and
then I went outside to play. //

The woman who had red hair broke her leg // and
the black-haired man broke his arm. //

As an index of syntactic maturity or complexity, the T-unit,
according to Hunt, "has the advantage of preserving all the
subordination achieved by the student, and all of his coördina-
tion between words and phrases and subordinate clauses." Hunt
continues:

> Slicing a theme into these units does destroy the
> student's coordination between main clauses, or, more
> accurately, between T-units. . . . But to do so is
> a gain rather than a loss, if one is searching for
> an index of maturity. For it has been shown that
> certain fourth graders destroy the significance of
> sentence length by their tendency to string T-units
> together endlessly with and after and, forgetting
> to use periods. In fact, coordination with and

between T-units is an index of _immaturity_ sig-
nificant for grade at the .01 level. So such
destruction is merciful. (Hunt, 1965, pp. 21-22)

Excessive coordination of independent clauses and inadequate
subordination of one idea to another are, of course, two
problems which also appear in the written discourse of some
college freshmen, even though both problems may be less pro-
nounced for the older group than for elementary students.
Nevertheless, for a given population, the longer mean T-unit
length is, the greater seems the probability that the writers
have been able to subordinate less important ideas to those
expressed in main or independent clauses. Another measure
of syntactic maturity or complexity, the ratio of T-units to total
clauses, may, however, be a better indicator of this phenomenon
than mean T-unit length.

Mean Clause Length. Mean T-unit length gives some indica-
tion of how writers put together ideas in minimum sentences.
Mean clause length, on the other hand, gives some indication
of the relative semantic complexity or density of both dependent
and independent clauses within sentences. Mean clause length
is calculated by using procedures similar to those for slashing
passages into T-units. If the "Moby Dick" passage, which was
initially slashed into T-units, were also slashed to indicate
the number of dependent or subordinate clauses, it would look
like this:

I like ~~the~~ movie / we saw about Moby Dick the
white whale // the captain said / if you can
kill the white whale Moby Dick / I will give
this gold to the one / that can do it // and it is
worth sixteen dollars // they tried and tried //
but / while they were trying they killed a whale
and used the oil for lamps // they almost caught
the white whale //

To the five T-units (marked with "//") into which we initially
divided the sentence, we have added five divisions to mark the
dependent clauses. These divisions are marked with a "/".
Thus we have divided the sentence into its ten clauses, five
independent and five dependent or subordinate. By dividing
the total number of words of the passage (67) by the total
number of clauses (10), we are able to calculate the mean clause
length for the entire passage--in this case, 6.7 words.

Subordination Index. As we have pointed out, the total
number of clauses, dependent and independent, in the passage
is 10 and that the total number of T-units is 5. To calculate
the subordination index, the ratio of independent clauses to
total clauses, we simply divide the total number of clauses
by the total number of T-units. For the "Moby Dick" passage,
we find that on the average each T-unit contains two clauses,
one of which is an independent clause. Thus we observe a 1-to-1
ratio of independent to dependent clauses. Calculating this
ratio gives us some notion of the amount of clausal subordination

in a given passage or group of passages. Indirectly, and in
conjunction with mean T-unit length and mean clause length,
this ratio also suggests the amount or depth of embedding. That
is to say, it gives some indication of the number of clauses
reduced to less-than-clause status that have been embedded in
both the T-units and the clauses.

Coordination-Within-Sentence Index. As we have pointed
out, the lengths of sentences can vary considerably according
to punctuation skill and writing style. Thus any index which
is based on sentence length must be viewed with reservations.
However, the amount of coordination among independent clauses
does indicate something of the development of syntactic control:
younger writers tend to coordinate more independent clauses
within sentences than older writers do. For the "Moby Dick"
passage, calculating this index allows us to quantify the obvious
heavy coordination within the sentence, and the writer's lack
of punctuation skill. For this passage, we find a coordination-
within-sentence ratio of 5 to 1, that is, 5 T-units per sentence.

Mean Sentence Length. As should be apparent, mean
sentence length tells us less precisely than either mean T-unit
length, mean clause length, or mean number of clauses per T-unit
anything about the syntactic abilities of writers. But sentence
length does suggest some developmental trends and has been used
(see Marckworth and Bell, 1967) to distinguish among many kinds
of discourse produced by skilled writers, discourse ranging
from mystery fiction to government documents.

It should be pointed out that these five indices relate to one another mathematically in the following way. By multiplying mean clause length by the mean number of clauses per T-unit, one arrives at the mean number of words per T-unit; and if one multiplies the mean length of T-units by the mean number of T-units per sentences, one arrives at the mean number of words per sentence. Thus the following simple formula obtains and can be used to check the accuracy of the calculations for these five indices of syntactic maturity or complexity.

$$W/C \times C/T = W/T \times T/S = W/S$$

It should, however, be pointed out that the numbers appearing in tables are frequently rounded numbers, so that the possibility of some differences does exist.

Free Modifiers. In addition to Hunt's indices of syntactic maturity or complexity is a set of measures identified by the late Francis Christensen. Christensen's work has been accessibly anthologized in Notes Toward a New Rhetoric (1979), the current edition of which lists Francis Christensen and Bonniejean Christensen as co-authors but which contains nine important essays by the former and only three non-essential, prefatory sentences by the latter. Christensen's generative rhetoric of the sentence, with its emphasis on the cumulative sentence, is important to the study of syntactic structures in written discourse. The cumulative sentence, as Christensen defines it, is a sentence whose movement from beginning to end is typified by additions to the

base clause or main clause, additions which function as non-restrictive modifiers placed either before, within, or after the base clause. Christensen called these additions "free modifiers"; and in grammatical terms they can take several different forms: participial, infinitive, adjective, and prepositional phrases; absolutes and appositives; and non-restrictive clauses marked either with a subordinating conjunction or a relative pronoun.

These non-restrictive additions to base clauses can be illustrated as follows:

Participial Phrase

> One of the most common free modifiers is the participial phrase, <u>consisting of a series of words introduced by the "-ing" or "ed" form of a verb</u>.

Infinitive Phrase

> The principal reason for adding free modifiers to a base clause is to add information or content economically, <u>to say more in fewer words</u>.

Adjective Phrase

> The free modifier, <u>long or short</u>, adds specificity to the base clause.

Prepositional Phrase

> The cumulative sentence, <u>with its free modifiers</u>, can be quite long.

Absolute Construction

The cumulative sentence, <u>its free modifiers</u>
<u>often placed to the right of the verb</u>,
seems to deliver its sense as it moves
along.

Appositive Construction

I like the movie we saw about Moby Dick, <u>the</u>
<u>white whale</u>.

Non-Restrictive Relative Clause

Short relative clauses, <u>which often add non-</u>
<u>essential information to a sentence</u>, can
easily be reduced to prepositional phrases.

Non-Restrictive Clause Marked with a Subordinating
Conjunction

Free modifiers, <u>because they can significantly</u>
<u>alter the rhythm of a sentence</u>, are fre-
quently used to achieve certain stylistic
effects.

It is important to note that the procedures adopted for counting free
modifiers demand that they be punctuated correctly, that is,
set off by one or more commas from the rest of the sentence.
These procedures thus make the use of free modifiers in syntactic
analysis as much a test of punctuation skill as it is a test of syntactic
manipulation.

Free modifiers, of the types noted, have been found to pre-
dict a significant percentage of the variance among the quality

scores assigned holistically to groups of essays.   Nold and Freedman

(1977), for example, showed that 12% of the variance in the holistic

scores assigned to essays written by Stanford Universtiy freshmen

was predicted in a regression analysis by the percentage of total

words in final free modifiers, those added to the ends of sentences.

Faigley (1979c), using similar statistical techniques, drew similar

conclusions in his study of the writing of University of North

Dakota freshmen, showing that 16% of the variance among quality

scores was predicted by the percentage of T-units with final free

modifiers.   Elsewhere, Faigley (1979a) compared the writing of

his North Dakota freshmen to that anthologized in Hall and Emblen's

A Writer's Reader (1976) on the basis of words appearing in initial,

medial, and final free modifiers.   The results of this comparison

appear in Table 3.5.   The fact that the figures for the Hall-Emblen

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Insert Table 3.5 about here.

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writers include analyses for several kinds of discourse--narration,

description, exposition, and argumentation--should indicate the

importance of examining the occurrence of free modifiers in the

written discourse of E 306 students.

When we examined the "high" and "low" quality essays of E 306

students in terms of these syntactic features--whether those identi-

fied by Christensen or those identified by Hunt--we had followed

certain procedures and rules to insure consistency.   These procedures

and rules are those used by the Miami University investigators

(Morenberg, et al., 1978) and by Faigley (1979c).

Comparison of "High" and "Low" Quality Essays. With the Hunt indices of syntactic "maturity" and the Christensen free modifiers used as the criterion variables, how do the two groups of E 306 essays compare?

First, a comparison of the two groups based on Hunt's five indices of syntactic maturity or complexity. The relevant data for this comparison are summarized in Table 3.6. As Table 3.6

Insert Table 3.6 about here.

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indicates, the average T-unit length of the "high" quality E 306 essays is 1.64 words longer than the average T-unit of the "low" quality essays. That is to say, the writers of the "high" quality essays wrote, on the average, T-units which were a little over 12% longer than those found in the "low" quality essays. The clauses of the "high" quality essays were also larger; in fact, they were, on the average, 1.81 words or 24.2% longer than the clauses found in the "low" quality essays. As should be expected, the differences in mean T-unit length and mean clause length are reflected in mean sentence length, with the sentences of the "high" quality essays running some 6.7% longer than the sentences of the "low" quality essays. Similar differences, but in the opposite direction, also obtain for the other two indices, mean number of clauses per T-unit and mean number of T-units per sentence. The "high" quality essays exhibited, on the average, nearly 11% fewer clauses per T-unit and about 5.1% fewer T-units per sentence than did the the "low" quality essays.

Apart from the obvious differences in the length or number of particular features, what do these differences tell us about the writing of the two groups of students? The answer to this question must be somewhat speculative in nature because the indices used to calculate these differences actually tell us very little that will allow us to account precisely for the syntactic structures the better writers used to lengthen their T-units, clauses, and sentences and to reduce the number of clauses per T-unit and the number of T-units per sentence.

The longer T-units and, to some extent, the longer sentences may indicate that the better writers were able to control more information per independent clause than were the poorer writers.

Consider the following series of T-units, keeping in mind that the T-unit can be "immaturely" (and, in some cases, artificially) lengthened.

(1) The woman, who had red hair, fell down. (8 words)

(2) The woman having red hair fell down. (7 words)

(3) The woman with red hair fell down. (7 words)

(4) The red-headed woman fell down. (6 words)

Most would probably agree that all four of these T-units say the same thing, deliver the same content; yet they differ from one another with respect to the syntactic structure each

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employs to deliver a portion of that content. In question
here is, of course, the embedded sentence "The woman had red
hair." That embedded sentence is realized differently at
the surface level in each of the T-units. In T-unit (1) the
embedded sentence takes the form of a relative clause; in
T-unit (2), the form of a participial phrase; in T-unit
(3), the form of a prepositional phrase; and in T-unit (4),
the form of a pre-nominal adjective. T-units (2), (3), and
(4), all employ structures which, in effect, reduce the rela-
tive clause of T-unit (1) to less-than-clause status. Through
such clause reductions, writers are able to reduce the total
number of words required to deliver a given content, thus enabling
them to say more in fewer words. Although Hunt's indices do
not tell us whether the writers of the "low" quality E 306 es-
says actually used relative clauses where embedded participial
or prepositional phrases or pre-nominal adjectives would have
been more economical, we suspect that the better E 306 writers
tended more often than did their counterparts to use the more
economical embeddings and clause reductions, a suspicion partially
confirmed by the fewer average number of "clauses per T-unit"
observed in the "high" quality E 306 essays.

These types of clause reductions more than likely also ac-
count for the longer clauses of the "high" quality essays. The
same four T-units cited above provide support for this con-
jecture. Consider, for example, T-unit (1). With the embedded
relative clause, the mean length of the two clauses in this

T-unit is 4 words. Now consider T-units (2), (3), and (4), each of which exhibits a different clause reduction so that each T-unit contains but one clause, the independent or base clause. If we calculate the clause length for each of these three T-units, we find that it is identical to the T-unit length, or 7 words, 7 words, and 6 words, respectively. Thus our three clause reductions have the new effect of lengthening the average clause length in each case while, at the same time, reducing the length of the T-unit.

Now if we take this kind of economical clause lengthening to be typical of the writing of the better E 306 students, then we are able to account for the longer T-units of the better E 306 writers. There are primarily two ways by which a T-unit can be lengthened, either by adding subordinate clauses to it or by embedding reduced clauses into it. Since the "high" quality essays exhibit fewer clauses per T-unit tnan do the "low" quality essays, it is reasonable to infer that the better E 306 writers tended to embed a larger number of reduced clauses into the base or independent clause of the average T-unit than did the poorer writers. Because the clauses of the better writers tended also to be longer, it is also reasonable to infer that even in some subordinate clauses, the better writers embedded reduced-clause structures, such as prepositional and participial phrases and pre-nominal adjectives.

We have not, of course, discussed all the syntactic structures that writers have at their disposal to lengthen T-units and

clauses. Nor shall we. But we will name a few of those
commonly employed by college freshmen: coordinate subjects,
coordinate predicates, serial constructions, ellipses, and
single-word adverbs. We have, on the other hand, devoted
considerable attention to several non-restrictive phrases
and clauses which qualify as "free modifiers," each of which
can serve to lengthen substantially a T-unit or a clause.

To the occurrence of these "free modifiers" in the "high"
and "low" quality E 306 essays we now turn our attention. For
each of our two groups of essays, we calculated the percentage
of total words used as free modifiers and the percentage of
total T-units displaying one or more free modifiers. These
data are summarized as Table 3.7 and Table 3.8.

Insert Table 3.7 about here.

Insert Table 3.8 about here.

Table 3.7 and Table 3.8 reflect differences between the
"high" and "low" quality E 306 essays similar to those we ob-
served with reference to Hunt's five indices. In fact, we
can assume that the differences between the two groups of es-
says observed with reference to Hunt's indices can be accounted
for by the differences in occurrence of free modifiers in the
two groups. As Table 3.7 indicates, over 10½% of the total

number of words in the five "high" quality essays were em-
ployed by the better writers in "free modifiers," while only
less than 6% of the total words of the "low" quality essays
appeared in "free modifiers." The words in the "high" quality
essays appearing in free modifiers were distributed across
the three categories of "initial," "medial," and "final," with
39.1%, 15.2%, and 45.7% of the total words used as free
modifiers falling into the respective categories. In contrast, of
all the words appearing in free modifiers in the "low" quality
essays, none was found in the "initial" position, 28.3% were
found in the "medial" position, and 71.7% were found in the
"final" position. Not only, then, were there fewer words,
relatively speaking, in the free modifiers of the "low" quality
essays than in the free modifiers of the "high" quality essays,
but those words were distributed across the categories in en-
tirely different ways. In terms of the percentage of T-units
having free modifiers, the difference between the two groups
of essays is equally remarkable. As Table 3.8 indicates, while
28.44% of the T-units in the "high" quality essays contained
free modifiers, only 10.1% of the T-units in the "low" quality
essays contained them. Differences between the two groups
with reference to the distribution of free modifiers across
the categories--initial, medial, and final--necessarily com-
plement the distribution calculated previously in terms of
percentages of total number of words.

What do these observed differences between the two groups
of essays tell us about the writing behaviors of their authors?

Actually, they tell us a great deal. From these data on the
occurrence of free modifiers, it is possible to infer that a
significant portion of the difference between the two groups of
essays along the dimensions of Hunt's five indices is accounted
for by the greater incidence of free modifiers in the "high"
quality E 306 essays. We can also infer that these differences
are probably attributable to the heavier reliance, in the "high"
quality E 306 essays, on relatively sophisticated syntactic
structures, structures which do not appear with regularity in
the discourse of less skilled writers. Table 3.5 supports
this inference: it is these very structures, the ones con-
stituting the corpus of free modifiers discussed earlier, which
seem to distinguish the written discourse of accomplished,
highly skilled writers from that of less accomplished, less
skilled writers. As far as our two groups of E 306 writers
are concerned, the writers of the "high" quality essays appear
to be closer to the "norms" for the accomplished, skilled writers.

How do these University of Texas E 306 students compare
with other writers, both of the same age and of different ages?
As we suggested earlier, considerably more data for making
such a comparison are available for Hunt's five indices than
for free modifiers. In fact, it is possible to illustrate
the relative standings of the E 306 students along normative
or developmental continua for each of the five indices of syn-
tactic maturity which Hunt identified. To show these standings,
we have plotted the "pooled" scores of the "high" and "low"
quality E 306 essays along side the scores reported for different

groups of writers in other studies.   These data appear in Table 3.9.

Insert Table 3.9 about here.

As Table 3.9 shows, the averages for the E 306 writers fit
reasonably well into the overall pattern of development for
writers ranging in age and ability from third graders to
"skilled adults" who had published non-fiction professionally.
For the E 306 writers, mean T-unit length and mean sentence
length each exceed slightly the comparable means for Hunt's
twelfth graders.   But the mean clause length for the E 306
writers is somewhat less, 0.27 words, than that for Hunt's
twelfth graders.   The mean number of clauses per T-unit is,
however, larger than that for Hunt's twelfth graders, as is
the mean number of T-units per sentence.   Not only do the means
for the E 306 writers tend to follow developmental trends set
by the younger writers studied by Hunt and O'Donnell, et al.,
but they also anticipate the further development along these
dimensions exhibited by professional writers.   The mean length
of the E 306 T-units is shown to be shorter than the mean for
the professional writers studied by Cooper, et al., Faigley,
and Hunt.   Similarly, the clauses which these same professional
writers produced were longer than those produced by the E 306
writers.   A less clear developmental pattern is, however, ob-
served with respect to the mean number of clauses per T-unit,
although one might argue that the level of clausal embedding

within T-units reaches its maximum around the twelfth grade.
The longer sentences of Hunt's professional writers not un-
expectedly parallel the occurrence of longer T-units and
clauses for the same group. As for the mean number of T-units
per sentence, an indicator of the amount of coordination among
main or independent clauses within sentences, it would seem
that a good deal of such coordination appears in the written
discourse of fourth graders, somewhat less in that of eighth
graders, and considerably less in the writing of twelfth
graders. However, beyond the twelfth grade, it would appear
that writers once again begin using more coordinate main
clauses, but not nearly so many as they did as eighth graders.
All of this is to say that with the possible exception of mean
clause length and mean number of clauses per T-unit, the writ-
ers of the "high" and "low" quality E 306 essays tend to write
very much as they would be expected to write. The shorter
clauses and the larger number of clauses per T-unit would, how-
ever, seem to indicate that as a group the E 306 writers are
perhaps a little behind their counterparts at other universities
in their ability to embed reduced clauses in the sentences
they write. However, it should be pointed out that with a
sample size of 10, one or two students writing significantly
fewer words per clause and significantly more clauses per T-unit
than the norm for his/her age group could easily skew the data.

We can also highlight a few differences between the E 306
writers and their counterparts at other universities. In com-
parison with Faigley's North Dakota freshmen and Stewart's

New Brunswick freshmen, the E 306 students seem to write T-units

of about the length one would expect. However, the T-units

of the E 306 students do seem significantly shorter than those

of Cooper, et al.'s SUNY-Buffalo freshmen and Sodowsky and

Witte's Oklahoma freshmen. These differences can, perhaps,

be explained in terms of the apparent higher ability level of

the SUNY-Buffalo freshmen and in terms of the various writing

assignments used to elicit the written discourse from the vari-

ous populations. As we have pointed out, a number of researchers

have shown considerable variability in such length factors

for discourse written in different modes; and it is known, for

example, that the writing assignment used in the SUNY-Buffalo

study elicited discourse of an argumentative nature while

the E 306 and the North Dakota assignments encouraged students

to support a central idea by drawing on their personal experience,

usually expressed in the narrative and/or descriptive modes.

The clauses of the pooled E 306 essays were also shorter than

those found in the written discourse of the four other groups

of college freshmen listed in Table 3.9. And the mean number

of clauses per T-unit for the E 306 students was greater than

for two other groups of college freshmen. Although we believe

both findings indicate that the E 306 students should probably

be reducing some of the clauses they write, we also believe

that part of this difference may be attributable to the dif-

ferent writing assignments and part attributable to the fact

that the University of Texas exempts nearly 30% of its freshman

population from E 306. This exemption policy prevented us

from examining the writing of the best students entering the

University of Texas as freshmen during the Fall of 1978,
students whose abilities probably compare favorably to those
of Stanford and SUNY-Buffalo freshmen.

In contrast to a plethora of studies using Hunt's five
indices, only three studies were available that examined the
occurrence of free modifiers in the writing of college fresh-
men; and only two of these three present their data in a form
which lends them to comparison with the data for E 306 students.
The relevant data from these two studies--Faigley's (1979a)
study of North Dakota freshmen and Nold and Freedman's (1977)
study of Stanford University freshmen--and the relevant data
for the E 306 students appear in Table 3.10.

Insert Table 3.10 about here.

Table 3.10 indicates that in comparison with the University
of North Dakota entering freshmen, the E 306 students use the
syntactic structures which constitute the set of free modifiers
at a substantially higher rate. In fact, the beginning E 306
students used 21.5% more words in final free modifiers than
did their counterparts at the University of North Dakota. With
regard to the percentage of total T-units which included free
modifiers in the final position, the E 306 students used free
modifiers in 43.3% more T-units than did the North Dakota
freshmen. In comparison with the Stanford University freshmen,
the E 306 students used 23.4% fewer words in medial free
modifiers but 54.3% more words in final free modifiers. Because

the three writing topics used to elicit the data on which these figures are based varied considerably, it is difficult to interpret the meaning of these comparative figures. However, it would seem that E 306 writers do use free modifiers at a rate which appears not to be below the rate of use by other beginning college freshmen. Nevertheless, one look at Table 3.5 would suggest that E 306 writers have a long way to go before the frequency of occurrence of free modifiers in their writing approaches that of the professional writers anthologized in Hall and Emblen's A Writer's Reader (1976).

Although the foregoing analysis of syntax in the written discourse of 10 E 306 students is by no means an exhaustive one nor a statistically sophisticated one, we hope that it does present data which will enable sound decisions with respect to the kinds of instruction these students seem to need in their E 306 classes. We, however, will not discuss pedagogical strategies until we have presented all of our analyses of the "high" and "low" quality E 306 papers and the results of the five principal and the five derivative comparisons.

3.3 The Occurrence of First-Person and Second-Person Pronouns
      in "High" and "Low" Quality Essays

In the previous sections we distinguished between the "high and "low" E 306 essays on the basis of error frequencies and syntactic complexity. In this brief section, we will present another distinction, this one based on the frequency

of occurrence of first-person and second-person pronouns.
On the basis of Lunsford's analysis of essays written for the
British Columbia English Placement test (1979), we anticipated
that E 306 essays with low holistic scores would use more
first- and second-person pronouns than essays with high holistic
scores.

The relevant data for this comparison are summarized in
Table 3.11 and Table 3.12. As Table 3.11 indicates, first-

Insert Table 3.11 about here.

Insert Table 3.12 about here.

---

person pronouns constitute about one-half of one percent of
the total words in the "high" quality E 306 essays and nearly
one percent of the total words in the "low" quality essays.
Converted into frequency of occurrence, these percentages mean,
according to Table 3.12, that the writers of the "high" quality
essays used some form of the first-person pronoun once every 201.75
words or once every 13.19 T-units, while the writers of the "low"
quality essays used a first-person pronoun once every 112.67 words
or once every 8.25 T-units. Thus in terms of word-frequency
only, the writers of the "low" quality E 306 essays used a
first-person pronoun approximately 79% more often than did the
writers of the "high" quality essays. The differences between

these two groups of E 306 essays are even more striking in
terms of the occurrence of second-person pronouns. Table 3.11
indicates that of all the words in the "high" quality essays,
only 0.06 of one percent of them were second person pronouns,
while 3.55% of the words in the "low" quality essays fell in-
to that category. Table 3.12 expresses this noteworthy dif-
ference between the two groups in two additional ways. For
the "high" quality essays, a second-person pronoun appears
once every 1,614 words or once every 105.5 T-units; but for the
"low" quality essays, a second-person pronoun appears once
every 28.17 words or once every 2.06 T-units. In terms of the
frequency of occurrence in words, this means that the writers
of the "low" quality essays used some form of the second-person
pronoun 49 times as often as did the writers of the "high"
quality essays.

These differences are also reflected in the combined oc-
currence of first-person pronouns and second-person pronouns
in the two groups of essays. According to Table 3.11, less
than six-tenths of one percent of the words in the "high"
quality essays were either first- or second-person pronouns,
while nearly 4½% of the words in the "low" quality essays were.
This difference is similarly reflected in Table 3.12. In the
"high" quality essays, a first- or second-person pronoun ap-
peared once every 197.33 words or once every 11.72 T-units. In
contrast, in the "low" quality essays, some form of the first-
or second-person pronoun appeared once every 22.53 words or
once every 1.65 T-units. Thus in terms of the frequency of
occurrence in words, the writers of the "low" quality essays
used a first- or second-person pronoun almost eight times as

often as did the writers of the "high" quality essays.

We do not know, of course, whether the occurrence of
first- and second-person pronouns is a predictor of writing
quality, in these ten essays or in essays of other college
freshmen. That could only be established through the analysis
of a sample considerably larger than the 10 essays we analyzed
and through the application of sophisticated regression analyses
of the resultant raw data. However, these differences between
the "high" and "low" quality essays may be compatible with what
other researchers and theorists have had to say about the writer-
audience relationship in written discourse, a relationship
which has been a major concern to rhetoricians from classical
antiquity to the present. Modern-day discourse theorists--whether
interested principally in poetics as in the case of Jakobson
(1960) or in rhetoric as in the case of Moffett (1968) or
Britton (1975)--generally agree with the concepts of discourse
component interaction expressed in Kinneavy's (1971) communi-
cation triangle. Kinneavy holds that the function of a piece
of written discourse is determined by the primary emphasis of
the piece, on the writer (self-expression), the audience (per-
suasion), the subject matter (reference discourse), or the
medium (literary). Moffett treats the functions of discourse
in terms of the possible interactions which can exist among
the "I" (writer), the "you" (audience), and the "it" (the sub-
ject matter). Moffett's discussion these interactions in terms
of the three classes of personal pronouns in the English
language is germane to this analysis.

Britton adds another dimension, both implicit and explicit in Kinneavy's model, that of physical and psychological distance between the writer and his/her audience. Without developing our notion to the extent it deserves, we hypothesize that the greater occurrence of first- and second-person pronouns in the "low" quality E 306 essays on this topic suggests that these writers, and we are here drawing on Britton's Piaget-informed analyses of the writing of British school-children, have not yet developed the ability to abstract themselves from either their audiences or their subject matters. That is to say, the occurrence of first- and second-person pronouns in the "low" quality E 306 essays suggests that the world view of these students is still very much an egocentric one. This is not to imply anything denegrating about these writers; it is only to suggest that psychologically they have yet to develop as much as their counterparts who wrote the "high" quality essays. Given the time and the proper encouragement, their writing will become less egocentric when occassion demands, just as surely as their T-units and clauses will grow longer as they, the students, grow older.

3.4 Text Cohesion

Each of the three previous analyses has provided insight into te: ual differences between student essays rated high and low in quality, but none indicates that we will be able to characterize adequately the quality of essays on the basis

of features at and below the sentence level. While the sentence may be the basic unit of communication, it is important in written texts only insofar as it relates to the context of the whole discourse.

If repetition is any measure of the importance a particular group attaches to a given concept, then the problems associated with coherence in the writing of college freshmen represent one of the major concerns of composition teachers and textbook writers alike. To some extent, this concern with coherence results from inadequate materials and methods for teaching it; and to some extent, it results from a general ignorance of the many devices writers have at their disposal for achieving coherence in extended discourse.

It seems to us that the state of the art is partly attributable to the considerable attention composition researchers and teachers devote to matters which can be discussed almost exclusively in terms of sentence-level operations and features. Punctuation and grammar instruction, which often warrant a good deal of time in the classroom, is focused within the boundaries of a sentence, unless the teacher not intelligently regards paragraphing as a punctuation skill. Similarly, matters of style are most often treated with reference to sentence-level syntactic structures or lexical choices within sentences --all this in spite of the composition teacher's goal of teaching students to write units of discourse extending beyond the sentence, and even beyond the paragraph.

When coherence is taught, it is usually taught in one
of three ways: by presenting examples for the purpose of
distinguishing between the concept of unity and the concept
of coherence; by imploring students to use traditional transition-
al words such as conjunctive adverbs between their sentences;
and by impressing upon student writers the importance of thesis
statements, topic sentences, logical patterns, development of
ideas, support, specific details, etc. Of course, all of
these strategies and concepts are to one degree or another
useful, because they approach the idea of text from the stand-
point of a semantic unit, as an extended series of meanings
whose components must somehow be made to relate to one another.
Yet problems of coherence persist in the writing of many col-
lege freshmen, primarily because (we think) such strategies
and concepts as those detailed above, while at some point
generally useful and usefully applicable, do not point students
and their teachers to specific devices they need to achieve
or to teach coherence in an extended discourse.

Others have, of course, recognized the inadequacies of
these traditional concepts and strategies. And several recent
composition researchers have formulated alternative concepts
and strategies. A few examples, not an exhaustive survey,
follow. During the mid-1960's, Christensen (1965) extended
his notion of a generative rhetoric of the sentence to include
a generative rhetoric of the paragraph. Christensen maintained
that when beginning transitional sentences are excluded, most
paragraphs move from a general semantic level to increasingly
more specific semantic levels. Thus following the most general

sentence--the "topic" sentence--subsequent/sentences exist
at a lower level of generality relative to the "topic" sen-.
tence. Within a given paragraph, a non-topic sentence could
thus be coordinate or subordinate in level of generality to
the preceding sentence. Here is an example of such a para-
graph, its topic sentence labeled "(1)" to indicate the
higher level of generality and the subsequent sentences marked
with larger numbers to show their lower .levels of generality
relative to the topic sentence.

(1)
　　　(2)
　　　(2)
　　　　　　(3)
　　　　　　　　(4)
　　　　　(3)
　　　　　(3)

All sentences not labeled "(1)" exist at a lower level of
semantic generality than sentence (1); that is to say, they
are subordinate in meaning to sentence (1). Tn this sequence
the sentences labeled "(2)" are coordinate in meaning to one
another, whereas the sentences labeled "(3)" and "(4)" are
suboidinate in meaning to the sentences labeled "(2)." And
so on. Grady (1971), D'Angelo (1974), and Wittig (1975) have
extended to the essay Christensen's idea of semantic levels
of generality in the sentence and the paragraph.

While Grady, D'Angelo, and Wittig make important applica-
tions of Christensen's theory to larger .nits of discourse, these
riters do not actually advance the theory itself. However,
.arrfalt　　　　(1968) and Pitkin (1969) do. Karrfalt, taking

issue with Christensen's contention that paragraphs progress
to successively lower levels of generality, observes that some
sentences in some paragraphs extend the meaning of a pre-
vious sentence to a higher level of generality. In this,
Karrfalt anticipates Pitkin's concept of superordination. Pitkin
identifies, on the basis of function within the whole discourse,
hierarchically ordered semantic "blocs" of thought, which may
well extend beyond the boundaries of paragraphs but which do
not necessarily extend beyond the boundaries of, say, a sub-
ordinate clause in a given sentence. Pitkin argues that
within the context of the whole discourse, these "blocs" are
related to one another through coordination, through complementa-
tion (as in a cause-to-effect pattern), through subordination
(as in a classification pattern where the first "bloc" presents
the distinguishing features of a class and a second "bloc"
specifies members of that class), or through superordination
(the opposite of subordination and where the semantic movement
is, for example, from the specific instances to the general
class). Pitkin's theory of discourse "blocs" is compatible
with that of Rodgers (1966, 1967) who notes, quite rightly,
that "paragraphs are not composed; they are discovered" and
that a given semantic unit of discourse may span several semantic
chunks indented as paragraphs.

Also important to discovering principles of coherence
and of arrangement in texts are the ideas advanced by the
tagmemicists. Drawing on the linguistic theories of Kenneth
Pike (1964a, 1964b, 1965, 1967), Becker and Young have studied

paragraph structure in terms of certain functional semantic slots which they see as constituting semantic patterns when they are combined in paragraphs. Becker (1965) proposes three such patterns, each consisting of two or more functional slots --the QA (question-answer), the PS (problem-solution), and the TRI (topic-restriction-illustration)--and the various possible combinations and permutations of these three basic types. The underlying theory and the implications of this system for analyzing paragraphs are elaborated by Young and Becker (1965) elsewhere.

Now spanning several disciplines, research in text comprehension and production has established that syntactic structures are formed relatively late in production and forgotten early in comprehension. Consequently, much empirical research in discourse comprehension and many theoretical models of text structure follow semantic, rather than syntactic, lines; and several of the models now being tested empirically view texts as underlying sets of semantic propositions arranged hierarchically (e.g., Frederiksen, 1977; Kintsch, 1974; Meyer, 1975). Considerable empirical evidence indicates that sentences located high in the structural hierarchy of a text are recalled more frequently than sentences located low in the heirarchy (Kintsch 1974; Kintsch & Keenan, 1973; Kintsch, Kozminsky, Streby, McKoon, & Keenan, 1975; Meyer, 1975; Thorndyke, 1977).

As noted above, researchers in written composition have recognized the importance of semantic relationships in extended units of discourse, and some have suggested ways such relationships

might be analyzed (Winterowd, 1970; Cummings, Herum, & Lybert,
1971). These systems, however, are difficult to apply empiri-
cally to individual texts. More recently, European text
linguists began considering the question of what is a text.
One criticism of early text structure models advanced by
linguists (e.g., Harris, 1952) was that a satisfactory defini-
tion of a text was assumed by such models but did not exist
in fact.

Halliday and Hasan address the problem of textuality in
Cohesion in English (1976). They set out a systematic and
presumably comprehensive method for analyzing cohesive ties
in extended discourse. They do not attempt to provide a
model of text structure but to define a text in terms of co-
hesive relationships among sentences. Their system for analyzing
cohesive ties in a stretch of discourse considers a text as
a semantic unit, linked together by cohesive ties. Cohesion,
therefore, "is a semantic relation between an element in a
text and some other element that is crucial to the interpreta-
tion of it" (1976, p. 8). Central to Halliday and Hasan are
the notions of presupposing and presupposed elements; and al-
though presupposing and presupposed elements can co-occur
within a sentence, it is cohesive ties between presupposing
and presupposed elements across "sentence boundaries" which
allow sequences of sentences to be realized as a text unit.

Halliday and Hasan's system for analyzing and classifying
cohesive devices provides for five major classes of cohesive
devices, nineteen subclasses, and numerous sub-subclasses.

Here we will be concerned with the five major classes of co-
hesive devices--<u>Reference</u>, <u>Substitution</u>, <u>Ellipsis</u>, <u>Conjunction</u>,
and <u>Lexical</u> <u>Reiteration</u> and <u>Collocation</u>--and their respective
subclasses.

<u>Cohesion through Reference</u>. In English there are a large
number of words of various kinds which in a text "make reference
to something else for their interpretation" (p. 31) rather than
"being interpreted semantically in their own right" (p. 31).
These words are "directives indicating that information is to
be retrieved from elsewhere" (p. 31). The information which
is retrieved "is the referential meaning, the identity of the
particular thing or class of things that is being referred to;
and the cohesion lies in the continuity of reference, whereby
the same thing enters into the discourse a second time" (p. 31).
Reference is, ho·ever, not exclusively concerned with items
in the text itself: the presupposed item can exist outside
the text proper in the situational context. For example, it is
possible to utter the following sentence in a given situational
context and expect the listener to understand fully what is
meant: "Will you turn that off?" Both <u>you</u> and <u>that</u> presuppose
two objects which do not exist in the text itself. Similarly,
in written discourse we frequently encounter the first-person
plural pronoun, as in this sentence, or the singular form or
second-person pronouns; and we do so without having the pre-
supposed specific person or persons named in the text itself.
In the previous sentence, <u>we</u> could have one of any number of
possible antecedents outside ·he text itself, but it has none

which is text explicit. Reference beyond the text itself

to the context of the discourse is "exophoric" reference; and

according to Halliday and Hasan, exophoric reference "makes

no contribution to the cohesion of a text" (p. 53). Again

according to Halliday and Hasan, certain occurrences of

you, one, we, they, and it simply make it possible for a

writer "to conform to the structural requirements of the clause,

which demands a nominal in various places" (p. 53). Reference

within the text itself is called "endophoric" and may be either

"anaphoric," referring to some previous item or items in the

text, or "cataphoric," referring to some item or items which

follow in the text. These two types of endophoric reference

may be illustrated as follows:

Anaphoric Reference

   (1)   John bought an apple. //*

   (2)   He bought it yesterday. //

Cataphoric Reference

   (3)   That was good. //

   (4)   It was the best meal I've ever eaten. //

*Here and in all subsequent examples the double slashes
represent T-unit boundaries. This practice is employed
because text cohesion deals, technically, with dis-
course across T-units and because the T-unit will
be one of the denominators used later in this section
to quantify cohesion in the E 306 essays.

Sentence (2) contains two examples of anaphoric reference: He

and it depend for their meaning on the prior occurrence of John

and apple in sentence (1). Sentence (3) and sentence (4) each

contain an example of cataphoric reference, although in treating
matters of text cohesion we are not concerned with within-
sentence reference as in sentence (4). Nevertheless, the demon-
strative <u>that</u> in sentence (3) looks forward, rather than back-
ward, to <u>meal</u> for its meaning. Anaphoric and cataphoric cohesive
ties can arise for all three of the subclasses of reference co-
hesion--<u>cohesion through pronominals</u>, <u>cohesion through demon-
stratives and definite articles</u>, and <u>cohesion through comparatives</u>.

The most common type of reference cohesion is that which
is achieved through the use of <u>personal pronouns</u>. The example
of anaphoric reference in sentences (1) and (2) above contains
two cohesive ties based on the appearance of personal pronouns:
the pronouns <u>he</u> and <u>it</u> in sentence (2) take their meaning from
the nouns <u>John</u> and <u>apple</u> in sentence (1). Another example,
drawn from the set of E 306 essays we examined is the following:

Reference Cohesion (Pronominal)

(5) At home, my father is himself. //

(6) <u>He</u> relaxes and acts in <u>his</u> normal manner. //

Across-sentence or across-T-unit cohesion here, as in sentences
(1) and (2), results from the pronouns <u>He</u> and <u>his</u> of sentence
(6) presupposing and gathering up into themselves the meaning
of <u>father</u> in sentence (5). Sentence (6), without sentence (5),
would be impossible to process, for without the presence of
the presupposed item, <u>father</u>, no cohesive tie would exist.

A second type of reference cohesion is that achieved through
the use of <u>demonstrative pronouns or definite articles</u>. Our

example of cataphoric cohesion supplies one example of the
use of a demonstrative pronoun to realize a cohesive tie, with
That of sentence (3) looking forward to the occurrence of
meal in sentence (4). One of the most common uses in the E 306
essays of demonstratives to achieve cohesion is illustrated
by sentences (7) and (8).

Reference Cohesion (Demonstratives)

    (7) We question why they tell us to do things. //

    (8) This is part of growing up. . . . //

The appearance of This in sentences (8) presupposes information
retrievable from sentence (7), without which sentence (8) would
have no meaning of its own. It is perhaps too obvious a point
to make, but notice that we are not able to process the meaning
of we, they, and us in sentence (7) because the presupposed items
are no where in the text provided, that is, no cohesive ties
exist. The use of the definite article can also create a co-
hesive tie within a text similar to the ones created through
the use of demonstratives. Consider, for example, the following
pair of sentences taken from an E 306 paper.

Reference Cohesion (Definite Article)

    (9) Humans have many needs, both physical and
          intangible. //

    (10) It is easy to see the physical needs such
          as food and shelter. //

The in sentence (10) functions very much as the demonstrative
those would have functioned had it appeared in the place of the.
The definite article in sentence (10) provides a cohesive tie

by virtue of the fact that the noun it modifies, in this case
needs, has a specific referent in the preceding sentence (9).
The definite article in sentence (10) helps specify the noun
needs in the same sentence, thus making needs in sentence (10)
more specific than needs in sentence (9); and in this way the
anticipates the appearance of food and shelter at the end of
sentence (10). Only in its presupposing function, however,
does the constitute a cohesive tie.

A third type of reference cohesion is achieved through
the use of comparatives. Comparatives become cohesive ties
within texts by virtue of the impossibility of writing a sen-
tence such as "X is like" and expecting meaning to result:
we must always write "X is like Y." As with pronouns, when
the "something else" exists outside the text, the reference
is an exophoric one and not cohesive; when in the text, it
is endophoric and cohesive. Comparatives need not, however,
name a particular "Y": they may stress "likeness and unlikeness,
without respect to any particular property" (p.77). Such com-
parisons are said to be "general." In contrast, "particular
comparison" involves comparison in terms of specific quantities
or qualities. General comparison typically involves comparison
focusing on identity, similarity, or difference between two
"things." Particular comparison, on the other hand, usually
specifies "likeness" or "unlikeness" in terms of quantitative
modifiers such as better or equally good. It would, of course,
be tedious to illustrate all possible types of comparative

reference which establish cohesion, but one example from an E 306 essay will suggest the importance of cohesive ties based on comparatives.

Reference Cohesion (Comparatives)

(11)   The males ruled the women; /7

(12)   the women obeyed and formed themselves into the mold the males constructed for them. //

(13)   But today it is different. //

In this T-unit sequence, the word different, a general comparative, presupposes and gathers up into itself the sense of the past expressed in sentences (11) and (12). Without sentences (11) and (12), it would be impossible to understand sentence (13). Although different is not a personal or demonstrative pronoun or a definite article, it does refer anaphorically to the meaning expressed in sentences (11) and (12), meaning which is presupposed by it. Thus different in sentence (13) constitutes a cohesive tie, intimating a contrast between the past and the present.

Cohesion Through Substitution. Whereas reference cohesion is achieved in texts by meaning-based relationships across sentence boundaries, cohesion through substitution is achieved through relationships based on wording. Mush less common in texts than reference cohesion, cohesion through substitution refers simply to the "replacement of one item by another" (p. 88). Cohesion through substitution can take three forms, involving,

respectively, replacement of nominals, verbals, or clauses by other items.

Cohesion through nominal substitution is illustrated in sentences (14) and (15).

Cohesion Through Substitution (Nominal)

(14) I have yet another behavior for the classroom. //

(15) That one society or, in this case, the university deems appropriate for the classroom. //

The word one in sentence (15) replaces or substitutes for the nominal behavior in sentence (14). The nominal behavior could very easily have appeared in sentence (15) without having created an unduly awkward expression; and herein lies an important difference between reference cohesion and cohesion through substitution. Often the presupposed item in a cohesive tie based on reference cannot be substituted for the item doing the presupposing without sacrificing, for lack of a better word, the "style" of the sequences. Consider, for example, sentences (5) and (6) above. The he and the his in sentence (6) cannot be replaced by the presupposed father and [father's] in sentence (5), without making the entire sentence sequence terribly awkward. Substitution, on the other hand, seems merely a matter of economy, and the cohesive tie which results from substitution (especially for nominals) can easily be achieved through cohesion based on lexical repetition, which is discussed below.

A second type of cohesion through substitution involves

verbs or verbals. Consider sentences (16) and (17).

Cohesion Through Substitution (Verbal)

(16) A father may expect his son to develop

interest and skill in playing football, //

(17) but the son may not do so. //

In this pair of T-units, do so in sentence (17) substitutes
for or replaces to develop interest and skill in playing foot-
ball in sentence (16). In this latter T-unit all of the mean-
ing of the earlier infinitive phrase is gathered up into its
replacement or substitute, do so. The appearance of do so in
T-unit (17) is not a matter of ellipsis, which is also a type
of cohesion, because nothing in the previous infinitive phrase
can be added grammatically to do so, whereas ellipsis is al-
ways "substitution by zero".

The final type of cohesion through substitution focuses
on the replacement of clausal structures by a word or words not
found in the clause being-replaced. Again, the example is
drawn from an E 306 essay.

Cohesion Through Substitution (Clausal)

(18) Do all people change their behaviors this

easily? //

(19) It seems so.

In the case of this pair of T-units, so replaces an entire
clause without renaming any element in the clause itself.
Sentence (19) literally means "It seems [that all people do

change their behavior this easily]," a meaning which can be understood from sentence (19) only because an anaphoric cohesive tie exists between the clausal substitute so in sentence (19) and the only clause in sentence (18).

Cohesion Through Ellipsis. Cohesion through ellipsis is, as we have already intimated, in some respects similar to cohesion through substitution. And, as we have also noted, it may even be called "substitution by zero" (p. 143). Yet the cohesive ties that result from each differ. In cohesion through substitution, a given word or set of words presuppose and replace the presupposed element. In ellipsis cohesion, the presupposing structure gives the impression of having left something unsaid while, at the same time, often repeating some element from that which is presupposed. For example, in the sequence "Who is taller? John" the cohesive tie is realized because is taller is ellided in the second part of the sequence, the interrogative who serving as a cataphoric reference for John. In cohesion through substitution, as in sentence (19), a particular word, so, fills a particular structural slot in the sentence and serves as a "place-marker for what is presupposed, whereas in ellipsis nothing is inserted in the slot" (p. 143). As with substitution, there are three subclasses of cohesion through ellipsis--nominal ellipsis, verbal ellipsis, and clausal ellipsis.

Cohesion through nominal ellipsis can be understood with reference to a presupposed nominal, the presupposing of which is frequently a modifying element for the nominal. In nominal ellipsis the nominal itself is ellided and the modifying element

changes its function within the presupposing sentence. A good example of exophoric nominal ellipsis appeared repeatedly in the speech of post-WWII West Germans, who referred to Konrad Adenauer as "Der Alte," a term of affection which ellides "Mann" of "Der alte Mann." An excellent example of endophoric nominal ellipsis appeared in one of the E 306 essays we examined:

Cohesion through Ellipsis (Nominal)

(20) Among most teenagers we can observe behavioral patterns that fall into three categories. //

(21) These might be called the good, the bad, and the ugly. //

In sentence (21) good, bad, and ugly are all instances of a nominal having been ellided by the addition, in the presupposing sentence, of modifying elements; and in the resulting ellipsis of behavioral patterns there exist three cohesive ties with the previous sentence. Thus in nominal ellipsis further specification of the ellided nominal can easily be achieved. A case could also be made for the plural demonstrative these in sentence (21) as supplying a cohesive tie through ellipsis of the nominal categories in sentence (20). Demonstratives, as we illustrated with sentences (7) and (8), often create cohesive ties through anaphoric reference. However, for the demonstrative this in sentence (8), it is not possible to supply the presupposed item in the form of a single-word nominal or by substituting one or ones for it, whereas such is possible for these in sentence (21) as in these categories. Hence this

in sentence (8) represents a cohesive tie achieved through
reference, while these in sentence (21) represents a cohesive
tie achieved through ellipsis.

Cohesion can also be achieved through verbal ellipsis.
Verbal ellipsis also involves "substitution by zero." In
verbal ellipsis, a presupposed verb phrase or portion of a
verb phrase does not fill the expected slot in the presupposing
sentence. Sentences (22) and (23), from an E 306 essay, pro-
vide an example of a cohesive tie based on verbal ellipsis.

Cohesion through Ellipsis (Verbal)

    (22) Do these changes in roles point to
           insincerity within us? //

    (23) To a degree, they do. //

In this example of verbal ellipsis, sentence (23) supplies
a part, do, of the verb phrase do . . . point to insincerity
within us, the remainder of the verb phrase being understood
from the preceding sentence. Hence the ellided part of the
verb phrase supplies a cohesive tie between sentences (22) and (23).

A third type of ellipsis is clausal ellipsis where an en-
tire clause from a preceding sentence is ellided from a pre-
supposing sentence. As with nominal and verbal ellipsis, the
resulting cohesive tie is anaphoric and involves "substitution
by zero." Sentences (24) and (25), drawn from an E 306 essay,
will illustrate:

Cohesion through Ellipsis (Clausal)

    (24) Can role-playing be reduced? //

    (25) Yes, i our society becomes more liberal. //

In this sequence, yes in sentence (25) provides a cohesive
tie by elliding the clause role-playing can be reduced which
is expressed as an interrogative in sentence (24). Note,
however, that with the presupposing yes and similar such words,
no part of the presupposed clause is repeated.

Cohesion Through Conjunction. The fourth major class
of cohesive devices is that known as conjunction. Conjunction
differs substantially from cohesion through reference, sub-
stitution, and ellipsis--all of which depend heavily on anaphoric
relations to create cohesive ties. The principal difference
between conjunction and the other types of cohesion we have
discussed are summarized by Halliday and Hasan:

Conjunctive elements are cohesive not in themselves
but indirectly, by virtue of their specific meanings;
they are not primarily devices for reaching out into
the preceding (or following) text, but they express
certain meanings which presuppose the presence of
other components in the discourse. (p. 226)

There are five major types of conjunction which establish co-
hesive ties across sentences, between presupposing and pre-
supposed items in the text. These are additive conjunction,
adversative conjunction, causal conjunction, temporal conjunction,
and continuative conjunction. Because the cohesive function
for each of these types is basically the same, we will pro-
vide successive examples of all types. Then we will discuss
the examples collectively, rather than individually. All of
these examples come from E 306 essays we examined.

Cohesive Conjunction (Additive)

(26) The college student who wore faded blue

jeans now wears three-piece suits, //

(27) and he feels the need to be approved of and

accepted by his new associates. //

Cohesive Conjunction (Adversative)

(28) People can usually be themselves when

they are with their friends. //

(29) However, people who are attempting to

make frier.is often feel a need to impress

these prospective friends. //

Cohesive Conjunction (Causal)

(30) Today's society sets the standards. //

(31) The people more or less follow it [sic]. //

(32) Consequently, there exists the right

behavior for the specific situation at

hand. //

Cohesive Conjunction (Temporal)

(33) A friend of mine went to an out-of-

state college, //

(34) and before she left, she expressed her

feelings about playing roles to win

new friends. //

Cohesive Conjunction (Continuative)

(35) Noone [sic] wants to be rejected, //

(36) and to prevent rejection we, of course,

cha ge our behavior often. //

As should be clear from our set of examples, both coordinating
conjunctions--such as <u>and</u>, <u>but</u>, <u>nor</u>, or <u>yet</u>, and <u>so</u>--and con-
junctive adverbs--such as <u>however</u>, <u>consequently</u>, and <u>moreover</u>--
can serve conjunctive cohesion by supplying cohesive ties across
sentence boundaries. In connection with the types of words,
especially coordinating conjunctions, that can supply cohesive
ties, it should be noted that conjunction, as far as cohesion
is concerned, is not the same as coordination. With coordination
there is the built-in notion of something like equivalence of
semantic stature, as in the case of coordinate subjects or
coordinate predicates. With cohesive conjunction the under-
lying notion is simply that of joining together explicitly
for some particular purpose.

It is also important to note that a cohesive relationship
can exist between two sentneces without a conjunction marker
present. For example, consider the following sentence sequence
from John Koffend's "The Case for Alcohol" (<u>Atlantic Monthly</u>,
Dec., 1979, p. 68).

> (37) Drink was so routine an embellishment of
>   American colonial life that the Puritans
>   called it "the good creature of God" and
>   arrived with plenty of spirits aboard the
>   <u>Mayflower</u>. //
>
> (38) Cups brimming with wine fermented from local
>   grapes were emptied at the first Thanksgiving. //
>
> (39) So insistent was the forefatherly thirst that
>   when local crops of wine grapes, malt, and hops
>   proved inadequate, our resourceful ancesters

> produced potent skullpoppers from artichokes,
> cornstalks, pumpkins, turnips, and horseradish. //

(40) Casks were broached as a matter of course at
ministerial investitures; //

(41) many of the clerics were themselves champion boozers,
and did not shrink from admitting it. //

(42) Wage contracts of the period frequently ratified

. . . the human right to inhale an occasional skinful.

In this sentence sequence, there appears no conjunctive marker between sentences (40), (41), and (42). Yet no one would probably dispute that between these T-units and exists in "spirit," although not in "letter." Sentence (41) quite clearly is additive, as is (42), both adding examples to the one expressed in T-unit (40), examples which illustrate the importance of alcohol during the colonial period. The coherence or cohesion which exists among the T-units, rather than depending on specific conjunctions, is a direct result of the semantic relationship of these T-units with sentence (37). This brings us to an important point, namely, that when analyzing conjunctive cohesive ties, we are concerned only with those which are marked explicitly in the text.

Turning to our examples, then, we observe that between T-units (26) and (27) there exists a text-explicit conjunction between the two T-units, even though one might question whether the additive and joining the two T-units is to be preferred over the subordinating conjunction because. The examples of adversative, causal, and temporal conjunction are fairly straightforward. Each of the cohesive markers presupposes the meaning contained in a previous sentence or set of sentences.

A word about continuative conjunction, however, may be useful. The class of continuatives contains s[ ] items as

now, of course, well, anyway, surely, and after all used in
a cohesive way. These words function as cohesive devices when
they carry the force of their non-reduced forms. Of course,
which appears in sentence (36) actually means you should have
known that already, that ought to be obvious to you, or this is
to be expected. According to Halliday and Hasan, such a con-
tinuative becomes cohesive "when it is slipped in as an incidental
or an an afterthought, since its interpretation becomes contingent
on the context (and therefore on the preceding text)" (p. 271.).

Lexical Cohesion. The fifth and last major kind of text
cohesion is that which includes cohesive ties based on lexical
relations. Lexical cohesion is realized through the selection
of vocabulary; and it is somewhat more difficult to identify
than the other four types of cohesion because every lexical item
has the potential for entering into a cohesive relationship and
because there is never anything inherent in the occurrence
of a given lexical item that makes it cohesive. If we were to
encounter the word this in a text, we would automatically refer
anaphorically to the text in order to recover the meaning of
the demonstrative. Similarly, if we were to encounter one as
a nominal substitute or an adjective filling the functional
slot of a nominal, we would, for the one, look back into the
text to determine what had been replaced by one and, for the other,
look back at the text to determine which nominal had been ellided.
So, too, with conjunction. When we encounter a conjunctive
adver' such as however, we attempt to establish from the pre-
ceding text the nature of the adversative relationship introduced.
Lexical cohesion, in contrast, results from the non-random oc-

currence of lexical items in the text, from the "patterned occurrence of lexical items," from the movement of the text "from one topic to another. . . on reasonably systematic lines with a certain consistency of topic and predictability of development" (p. 288).

Perhaps the most important notion associated with lexical cohesion is that of "environment." Each lexical item in a text has an environment "that will provide the context within which the item will be incarnated on . . . [a] particular occasion" (p. 289); and within this within-text environment or context of each lexical item, the "instantial" or "text meaning" of the item is determined, "a meaning which is unique to each specific instance" (p. 289). Our processing of a text involves our becoming aware of the "environment" of any lexical item appearing in the text so that "by the time any given lexical item is taken in, its context has already been prepared. The preceding lexical environment is perhaps the most significant component of this context," providing "a great deal of hidden information that is relevant to the interpretation of the item concerned" (p. 289). Although the lexical environment of a given lexical item includes not only words which are relevant to it semantically but also all words in the preceding text, "it is the occurrence of the item in the context of related items that provides cohesion and gives to the passage the quality of text" (p. 289). In determining lexical cohesion, "relatedness is a matter of more or less; there is no clearly defined cutoff point such that we can say that sunset, for

example, is related to just . . . [one] set of words and no others; and it is the closeness of the relationship that determines the cohesive effect" (p. 289).

There are "two kinds of relatedness, one kind being relatedness in the linguistic system and the other being relatedness in the text" (p. 290). Halliday and Hasan elaborate:

> There are degrees of proximity in the lexical system,
> a function of the relative probability with which
> one word tends to co-occur with another. Secondly,
> in the text there is a relatedness of another kind,
> relative proximity in the simple sense of distance
> separating one item from another, the number of words
> or clauses or sentences in between. The cohesive
> force that is exerted between any pair of lexical
> items in a passage of discourse is a function of
> their relative proximity in these two respects. (p. 290)

Cohesion is greatly influenced by the "overall frequency" of a given lexical item "in the system of the language" (p. 290). As a general rule, the higher the "overall frequency" of a given lexical item in the language, "the smaller the part it plays in lexical cohesion in texts" (p. 290). Thus in analyzing a text for lexical cohesion, one must employ a great deal of common sense, relying on internalized knowledge "of the nature and structure [of the language's] vocabulary" (p. 290) and on one's judgment as to what "constitutes a significant pattern and what does not" (p. 290). Obviously, in determining lexical cohesive ties within a text, we would ignore repetition of

grammatical items--such as pronouns, high frequency verbs,
verbal auxilliaries, and prepositions--since these can occur
with the full range of lexical items in the language.

Lexical cohesion can be achieved in a text through
reiteration and through collocation. In what follows we treat
lexical collocation and four types of lexical reiteration,
reiteration by means of the same item, of a synonym or near-
synonym, of a superordinate, and of a general item.

Between the types of lexical reiteration, there is no
clear-cut distinction, the result being a "continuum" of lexi-
cal reiteration ranging from repetition of the same item, to
repetition by the use of a synonym or near synonym, to repeti-
tion through the use of a superordinate, to repetition through
the use of a general item, and, even, to repetition through
pronominal reference (see the section Reference Cohesion
above). This continuum can be illustrated by examining two
sentences which occurred sequentially in an E 306 essay and
by examining some possible alternative renderings of the same
two sentences.

> (43) Drinking is typical of many college freshmen,
>   particularly members of some fraternities. //
> (44) This behavior is usually accompanied by obscene
>   talk. //

Although this is not a particularly striking set of sentences,
it does illustrate how a superordinate such as behavior in
sentence (44) depends for its "instantial" meaning on the prior
appearance of a related and more specific lexical item, in

this case the gerund drinking in sentence (43). In short,
behavior occasions an anaphoric cohesive tie between sentence
(44) and sentence (43). This pair of sentences, together with
some possible revisio , will also illustrate the other types
of lexical reiteration and their relationship to reference
cohesion.

Drinking is typical of college freshmen. . . . //

$$\left.\begin{array}{l}\text{The drinking}\\ \text{The boozing}\\ \text{The behavior}\\ \text{The thing}\\ \text{It}\end{array}\right]$$ is usually accompanied by obscene talk. //

With this illustration, we can see how a lexical cohesive tie
between two sentences can be created through the repetition
of the same item, in this case drinking. Similarly, the use
of boozing, a synonym, establishes a cohesive tie across the
boundaries of the two sentences. In both cases, part of the
meaning of the second item, whether it is the same item or
a synonym, must be recovered from the earlier occurrence. A
somewhat different type of lexical cohesion between the two
sentences is created if behavior is used as the presupposing
item since behavior, in this case a superordinate, has the
capacity to refer to any number of different activities, only
one of which is drinking. Having even less specificity is the
general noun, thing, which can include within its domain things
such as automobiles and sweaters, as well as activities such
as drinking. Lastly, the personal pronoun it can also be used,
illustrating the point at which lexical and reference cohesion

merge. It should also be noted that the in four of the five
instances cited has a cohesive function, discussed above in
connection with reference cohesion. Finally, we should point
out that in these same four cases, the demonstrative this can
be used in place of the, thus creating an alternative set of
cohesive ties.

Each of these four types of lexical reiteration are illus-
trated in the following sentence sequences derived from E 306
essays we examined. The items creating the cohesive tie in
each pair are underlined.

Lexical Reiteration (Same Item)

(45) Human behavior varies greatly, depending
     on the situations one experiences. //

(46) One's behavior can change due to the people
     he surrounds himself with. //

Lexical Reiteration (Synonym or Near-Synonym)

(47) One behaves according to the expectations of
     those around him. //

(48) Obviously, a young adult acts differently
     around friends than around his parents. //

Lexical Reiteration (Superordinate)

(49) Some professional tennis players, for
     example, grandstand, using obscene gestures
     and language to call attention to themselves. /

(50) Other professional athletes do similar things,
     such as spiking a football in the end zone, to
     attract attention. //

Lexical Reiteration (General Item)

> (51) Some professional tennis players, for
>   example, grandstand, <u>using obscene</u>
>   <u>gestures and language</u> to call attention
>   to themselves. //

> (52) Other professional athletes do similar
>   <u>things</u>, such as spiking a football in
>   the end zone, to attract attention. //

All the lexical cohesive relationships which cannot be
properly subsumed under lexical reiteration are included in
a miscellaneous class c⸍ ⸍ed <u>collocation</u>. Collocation refers
to lexical cohesion "that is achieved through the association
of lexical items that regularly co-occur" (p. 284). Lexical co-
hesion through collocation is perhaps the most difficult type
of cohesion to analyze in a given text because items said to
collocate involve neither repetition, synonymy, superordination,
nor general items. Consider, for example, the following two
T-units:

> (53) The eggs were delicious. //
> (54) The bacon was crisp. //

Lexical cohesion obtains across these two T-units by virtue of
two words, <u>eggs</u> and <u>bacon</u>; but these involve no repetition and
no synonymy; neither is one a superordinate for the other; in
context neither is one a general item which can include within
its semantic domain both the class of items represented by the
other and classes of items not included in the class of the other.

Yet the two words are systematically related to one another, primarily because the two words are frequently used together in the language. That is to say, they collocate. In Halliday and Hasan's words, a collocative cohesive tie exists

> between any pair of lexical items that stand to each other in some recognizable lexiosemantic (word meaning) relation. This would include not only synonyms and near-synonyms such as climb . . . ascent, beam . . . rafter, disease . . . illness, and superordinates such as elm . . . tree, boy . . . child, skip . . . play, but also pairs of opposites of various kinds, complementaries such as boy . . . girl, stand up . . . sit down, antonyms such as like . . . hate, wet . . . dry, crowded . . . deserted, and converses such as order . . . obey.
>
> It also includes pairs of words drawn from the same ordered series. For example, if Tuesday occurs in one sentence and Thursday in another, the effect will be cohesive; similarly dollar . . . cent, north . . . south, colonel . . . brigadier. Likewise with any pairs drawn from unordered lexical sets, like basement . . . roof, road . . . rail, red . . . green. The members of such sets often stand in some recognizable semantic relation to one another; they may be related as part to whole, like car . . . brake, box . . . lid, or as part to part, like mouth . . . chin, verse . . . chorus (or refrain); they may be co-hyponyms of the same superordinate term, i.e., both members of the same

more general class, such as <u>chair</u> . . . <u>table</u> (both

hyponyms of <u>furniture</u>), <u>walk</u> . . . <u>drive</u> (both hyponyms

of <u>go</u>); and so on. (p.285)

The members of such sets as these somehow relate to one another

semantically;. and while it may be possible, although certainly

not easy, to describe in some detail the nature of these relations,

it is not necessary to do so for the purpose of identifying co-

hesive collocational ties in a text or set of texts. What is

important is that the items said to collocate "share the same

lexical environment" (p. 286).

Three T-unit sequences from the E 306 papers we examined

will help illustrate the cohesive effects of <u>collocation</u> in

written discourse, one set of collocating items being under-

scored in each sequence.

(55) <u>Parents</u> expect certain kinds of behavior. //

(56) <u>Children</u>, however, cannot always live up

to these expectations. //

(57) Around <u>adults</u>, we usually put on our good

behavior masks. //

(58) Instead of replying "yeh," a <u>teenager</u> would

reply "Yes, sir." //

(59) On a <u>camping trip</u> with their parents,

teenagers behave more responsibly than they

do at home. //

> (60) Unwilling to help with household chores,
>
> at the camp site they gather wood for
>
> fire, carry tents and sleeping bags
>
> over long distances, and even get water
>
> from a creek or lake. //

As should be apparent from these examples, it is possible to
have rather long chains of collocational cohesion, chains which
can span across several T-units rather than only two as in
the examples. The examples also point out that collocational
ties "do not depend on referential identity and are not of the
form of reiteration accompanied by the or a demonstrative--
in other words, all lexical cohesion that is not covered by
'reiteration.'"

Comparison of "High" and "Low" Quality Essays.

Using a coding system derived from the one developed by
Halliday and Hasan (see pp. 333-355), we analyzed our sets
of five of the best and five of the poorest E 306 essays (as
determined by the holistic evaluations of pretest essays writ-
ten on the "Changes in Behavior" topic) in terms of the five
major types of cohesion--reference, substitution, ellipsis,
conjunction, lexical--and the various subclasses specified
above for each major type. We hypothesized that the qualita-
tive differences between the two sets of five essays each would
be reflected in the number and kinds of cohesive ties employed
by the two groups of writers respectively.

In order to compare the two essay sets along these 24
dimensions of text cohesion, we calculated for each dimension

for each essay group five indices: (1) the mean frequency in words of cohesive ties, determined by dividing the total number of words in a given essay set by the total number of cohesive ties of each type and subtype (W / CT Type) in that set; (2) the mean number of cohesive ties per T-unit, calculated by dividing the total number of T-units in a given essay set into the total number of cohesive ties of each type and subtype in that set (CT Type / T); (3) the percentage of the total number of cohesive ties represented by each type and subtype of cohesive ties in an essay set (CT Type / CT); (4) the number of cohesive ties per 100 T-units for a given essay set, which index is (CT Type/ T) X 100; and (5) the ratio of cohesive ties to total words in an essay set, a ratio which can be expressed as a percentage by multiplying the ratio by 100.

A comparison of the "high" and "low" quality E 306 essays follows, beginning with reference cohesion, proceeding through lexical cohesion to a comparison on the basis of total cohesive devices, and ending with a brief comparison of E 306 writers with SUNY-Buffalo writers follows.

As was demonstrated above, reference cohesion takes three forms--cohesion by means personal pronouns, demonstratives and the cohesive the, and comparatives. The relevant data for this comparison are summarized in Table 3.13.

Insert Table 3.13 about here.

The four indices listed across the top of Table 3.13 give us

four ways of comparing the occurrences of referential cohesive
ties in the two sets of E 306 essays. As Table 3.13 indicates,
some form of reference cohesion occurs once every 24.96 words
in the "low" quality essays and once every 19.4 words in
the "high" quality essays. The difference between the two
word frequencies indicates that one must read 5.56 more words
in the "low" quality essays before encountering a referential
cohesive tie than in the "high" quality essays. Table 3.13
also reveals that a substantial portion of this difference can
be attributed to the higher frequency of personal pronouns
in the better essays. Personal pronouns as cohesive ties ap-
pear with a frequency nearly four times as great in the best
essays as in the worst, with one personal pronoun appearing
once every 63.4 words in the best essays and once every 233
words in the worst. Although the difference in frequency of
occurrence of personal pronouns is the most pronounced, the
occurrence of demonstratives and cohesive definite articles
is also important, with one of these appearing approximately
every 78 words in the poorer essays and one every 59 words
in the better essays. A marked difference also shows up
between the frequencies of occurrence of comparatives, this
time the higher frequency belonging to the "low" quality
essays. While the higher frequency of personal pronouns,
demonstratives, and definite articles is to be expected in
the better essays, which have more content to tie together
than their counterparts, the lower frequency of comparatives
was not. We had expected that the presumably more sophisticated
writers, those receiving "high" holistic scores, would show
a greater tendency to compare concepts, objects, actions,

and persons represented in the texts. For these groups of
essays on this particular writing topic, such was not, however,
the case.

The differences between the two essay sets along the
dimensions of reference cohesion are also reflected, perhaps
more markedly, by other indices included in Table 3.13. Be-
cause the number of cohesive ties per 100 T-units is simply
the index CT Type / T-units multiplied by 100, we will focus
on the two indices listed at the far right of Table 3.13, the
percentage of total cohesive ties and the mean number of cohesive
ties per 100 T-units. The latter first. As the figures in
Table 3.13 indicate, the "high" quality essays exhibited nearly
twice as many referential cohesive ties per 100 T-units as
did the "low" quality essays, 84 per 100 T-units as opposed
to 48, or 0.841 referential cohesive ties per T-unit compared
to 0.478 per T-unit. This difference is, again, largely at-
tributable to the greater use of personal pronouns by the
better writers, who used 5 times as many personal pronouns
per 100 T-units as did the poorer writers. Demonstratives
and definite articles as cohesive ties appear almost twice
as often per 100 T-units in the better essays than they do in
the poorer essays, while the poorer essays display about 3.6
more comparatives per 100 T-units than the better essays.
Whether one uses the word as the unit of measurement or the
T-unit, differences between the two groups clearly obtain.
Analyses based on the T-unit may, however, be misleading,
unless one keeps in mind that the mean word length of the
T-units in the better papers is 1.64 words longer than that
for the poorer papers (see Table 3.6 above).

Cohesive ties resulting from nominal, verbal, and clausal ellipsis and substitution account for the fewest cohesive ties in both the best and the worst E 306 essays. For the best essays, 2.49% of all cohesive ties were the result of the three types of substitution and 2.68% the result of the three types of ellipsis. In contrast, 1.4% of all cohesive ties in the "low" quality essays were the result of substitution, all of these being nominal substitutions; and 4.2% of all cohesive ties resulted from ellipsis, principally nominal ellipsis but including a few instances of verbal ellipsis. The relevant data for substitution and ellipsis cohesion are summarized in Table 3.14 and Table 3.15, respectively.

Insert Table 3.14 about here.

Insert Table 3.15 about here.

Substitution and ellipsis represent relatively sophisticated ways of achieving cohesion across T-unit boundaries. Thus one would expect that the better E 306 writers would have employed significantly more such cohesive ties than did the poorer writers. As Table 3.14 indicates, some form of substitution occurred once every 126.9 words in the best essays and once every 349.5 words in the "low" quality essays. In terms of cohesive ties per 100 T-units, this means that 12.9 substitution ties per 100 T-units appeared in the "high" quality essays but only 3.4 in the "low" quality essays,

or that substitution occurred about 3.6 times more often in
the better essays than in the poorer essays. It should be
reiterated that the better writers used all types of sub-
stitution while their counterparts used only nominal substitu-
tion. For cohesion achieved through ellipsis, the differences
between the two groups are, in general, less pronounced, the
poorer writers producing 10.2 such ties per 100 T-units as
compared with 13.8 such ties for the better writers. However,
while the better writers used all three types of ellipsis, the
poorer writers employed only two, nominal and verbal. Yet
the relative frequency in words of ellipsis ties is essentially
the same for both groups, an elliptical tie occurring once
every 116.5 words in the poorer essays and once every 117.8
words in the better essays. In general, our survey of cohe-
sive ties based on ellipsis and substitution within the two
essay sets suggests that the better writers tended to employ
substitution by zero and substitution by not-zero more readily
than did their counterparts.

Just as differences between the two essay sets obtain for
reference, substitution, and ellipsis cohesion, so too do dif-
ferences based on the occurrence of the five types of con-
junctive ties--additive, adversative, causal, temporal, and
continuative. The relevant data for our two sets of E 306
essays are summarized in <u>Table 3.16</u>.

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Insert Table 3.16 about here.

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As Table 3.16 indicates, the frequency in words of all
conjunctive ties in the better essays is more than twice as
large as that for the poorer essays. For the better es-
says, one conjunctive tie occurs once every 25 words,
but for the poorer essays a conjunctive tie appears only about
once every 58 words. This substantial difference in the fre-
quency of conjunctive ties is attributable to the fact that
four of the five types of conjunctive cohesion appear with a
significantly greater frequency in the better essays than in
the poorer essays. Indeed, two of the types which figure important-
ly in the better essays appear not at all in the poorer essays.
These differences are most pronounced when they are viewed in
terms of occurrences per 100 T-units. Additive conjunctive
ties occurred more than twice as often per 100 T-units in
the better essays than in the poorer essays, 22.8 compared with
10.2. Adversative ties occurred 9.9 times per 100 T-units in
the better essays but not at all in the poorer essays. Whereas
causal conjunctions appeared 13.9 times per 100 T-units in the
"high" quality essays, they occurred only 1.7 times per 100
T-units in the "low" quality essays. Temporal ties appeared
about the same number of times per 100 T-units in the two essay
sets, 8.5 in the "low" and 7.9 in the "high." As with adversative
conjunctions, no continuatives appeared in the poorer essays, but
were used nearly 11 times per 100 T-units in the better essays.
Collectively, conjunctive ties appeared in the "low" quality

essays 20.4 times per 100 T-units, but they appeared 65.4
times per 100 T-units in the "high" quality essays, or more
than three times as often. These differences are similarly
reflected in the percentage of total cohesive ties accounted
for by the five types of conjunctive cohesion. In the bet-
ter essays, conjunctive ties accounted for 12.64% of all
cohesive ties in that set, but they accounted for only 8.4%
in the set of poorer essays.

Thus far we have summarized the differences between the
two sets of E 306 essays along the dimensions of cohesion
realized through grammatical relations--references, substitu-
tion, and ellipsis--and through conjunction, which bridges
the gap between grammatical and lexical cohesion. Now we
turn our attention to a comparison of the two essays sets
based exclusively on lexical cohesion, that is, on reiteration
and collocation. It will be remembered that lexical reitera-
tion consists of four subtypes--reiteration through repetition
of the same item, reiteration through synonymy, reiteration
through superordination, and reiteration through the use of
general items. As Table 3.17 illustrates, lexical cohesion
accounts for most of the cohesive ties

Insert Table 3.17 about here.

found in both essay sets, accounting for 66.43% of all ties
in the poorer essays and 65.9% in the better essays. The
slight difference between percentages suggests a greater simi-
larity between the two essay sets than there, in fact, is. In

terms of the frequency in words of the occurrences of lexical
ties, we observe that the poorer writers created a lexical
tie every 7.36 words while the better writers managed such
a tie every 4.79 words. This rather large difference, 2.57
words, between the mean distances separating lexical ties
in the two essay sets is explained by the frequencies for
the types of lexical rieteration and for lexical collocation.
The mean distance separating same items in the better essays
is on the average 2.16 words shorter than that in the poorer
essays; and the mean distance separating synonyms is 24.6
words shorter. Superordination was not used at all by the
poorer writers but was used once every 274.83 words by the
better writers. General items also appear more often in the
better essays than in the poorer, once every 126.85 words
as compared to once every 174.75 words. So too with the oc-
currence of collocational ties: these appear once every
41.12 words in the poorer essays and once every 17.36 words
in the better essays. These differences are even more notice-
able when they are viewed in terms of their occurrence per
100 T-units. Over a text span of 100 T-units, a same-item
tie occurs 105.1 times in the poorer essays and 179.2 in the
better essays. Synonymy appears 20.3 times and 48.5 times
per 100 T-units for the two groups, respectively; and nearly
twice as many general items appear in the better essays as
in the poorer essays per 100 T-units. One of the most striking
differences is the occurrence of collocational ties, with 94.1
per 100 T-units appearing in the better essays but only 28.8
in the poorer essays.

The percentage of total lexical ties represented by the four types of lexical repetition and by collocation is also revealing. These percentages appear in Table 3.18.

_____

Insert Table 3.18 about here.

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To some extent, these percentages suggest a greater range of cohesion-achieving skill among the writers of the "high" quality essays. Especially important in this regard seem to be the differences between the two groups in the use of same-item repetition, synonymy, and collocation.

These differences between the two sets of E 306 essays can also be viewed collectively. When, for example, we divide the total number of words in a given essay set by the total number of cohesive ties observed in that set, we find that on the average one encounters in the poorer essays a cohesive tie of some type once every 4.881 words and in the better essays a cohesive tie once every 3.159 words, a difference in excess of 1.7 words. A comparable difference obtains for the mean number of cohesive ties per T-unit in the two essay sets. On the average, 2.4237 cohesive ties appeared in each T-unit of the poorer essays, while 5.1693 ties per T-unit appeared in the better essays. This is to say that the better E 306 writers established, on the average, over twice as many cohesive ties per T-unit as did their counterparts. In short, the better writers produced discourse which, from the standpoint of

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cohesion, was considerably more dense than that of their poorer counterparts. This cohesive density is similarly reflected in the total number of cohesive ties per 100 T-units for each essay set. In the poorer essays, 242.4 cohesive ties occurred for each 100 T-units; but over twice that many, 516.8, appeared per 100 T-units in the "high" quality essays. Another kind of difference between the two essay sets appears when the ratio of cohesive ties to total number of words is calculated. These ratios, together with their conversions to percentages, appear in Table 3.19 for all cohesive ties and for each major type of cohesion for each essay set.

Insert Table 3.19 about here.

Table 3.19 actually requires no interpretation since it is simply another means of viewing the same data for the two essay sets. It should, however, be noted that it would be incorrect to infer from Table 3.19 that, for example, fully 31.66% of the words in the better essays function as cohesive ties. Such an inference would be valid only if all cohesive ties consisted of but one word. Some cohesive ties involve more than one word, as the following T-unit sequence illustrates.

(61) Human behavior varies greatly according to the situation one is experiencing at the time. //

. . . . . . [19 intervening T-units] . . . . .

(62)   Thus human behavior depends on the

people with whom one associates. //

In this sequence, the text cohesion realized through the
repetition of the phrase human behavior would be counted as
but one cohesive tie, even though four words are involved.

This T-unit sequence suggests yet another way of comparing
the cohesive features of the two sets of E 306 essays, one
which focuses on the distance separating the presupposing and
the presupposed items in a cohesive tie and one which Halliday
and Hasan describe (pp. 329-333) and employ analytically
(pp. 339-355). As T-units (61) and (62) illustrate, the pre-
supposed item in a cohesive tie does not necessarily reside in
the preceding T-unit. A cohesive tie can, in fact, span several
T-units before the presupposing and the presupposed items actually
enter into a cohesive relationship. And the span of text crossed
by a given cohesive tie p rides the basis for this other way
of classifying text cohesion. It would be possible, for example,
for the pronominal it to appear in the first of the 19 T-units,
which we shall label (61A), deleted from the above sequence.
In that case human behavior of T-unit (62) would be mediated
through the referential it back to the presupposed human behavior
in T-unit (61). If a second hypothetical T-unit, which we
label (61B), follows (61A) and includes the phrase human behavior,
then a different kind of relationship obtains. The following
modification of the earlier T-unit sequence will help illustrate
the points we are trying to make.

(61) Human behavior . . . . //

(61A) It . . . . . //

(61B) . . . human behavior . . . . . //

. . . . [N intervening T-units . . . .

(61P) Childish behavior . . . . //

. . . . [N intervening T-units . . . .

(62) . . . human behavior . . . . //

Notice that It in T-unit (61A) depends for its meaning on human behavior in the immediately preceding T-unit, (61). The cohesive relationship between the presupposing It and the presupposed human behavior can thus be characterized as an immediate tie. Now consider the cohesion which exists among T-units (61), (61A), and (61B). The phrase human behavior in (61B) is a repetition of the same phrase in T-unit (61), but that repetition is mediated through the It in (61A). Thus the cohesive relation between T-units (61) and (61B), which is realized through the repetition of the same lexical item, is said to be mediated by virtue of the intervening referential It in T-unit (61A). A third type of cohesive tie is that represented by the relationship of T-units (61) and (62), before we added T-units (61A), (61B), and (61P). When T-units (61) and (62) are separated by intervening T-units exhibiting no mediating cohesive ties, the cohesive relationship between the two is said to be remote, that is to say, spanning one or more T-units in which no related cohesive ties appear. A fourth type of cohesion results from the combination of mediated and remote ties. This type is illustrated by T-units (61B), (61P), and (62). In this sequence, the presupposed item,

human behavior of (61B), is both remote from the presupposing item of T-unit (62) and mediated through childish behavior of (61P). Thus cohesive ties can be classified as immediate, re-mote, mediated, or mediated and remote. Unlike the earlier classifications of cohesive ties--which are based on grammatical, lexical-grammatical, and lexical cohesion--the classification now proposed is based rather on the span of text separating the items in a cohesive tie.

For our two sets of E 306 essays, we classified all co-hesive ties according to this "span of text" system. Then we calculated the percentage of total cohesive ties repre-sented by the four different "span of text" categories for each of the two essay sets. The results of these computations appear in Table 3.20.

Insert Table 3.20 about here.

As Table 3.20 indicates, both groups of E 306 writers used about the same relative percentage of remote cohesive ties, 29.69% for the poorer writers and 26.94% for the better writers. However, the better writers used a substantially higher per-centage, 41.59% to 32.80%, of immediate ties and a substantially smaller percentage, 25.86% to 36.72%, of remote-mediated ties. Mediated ties appeared in the better essays with about eight times the frequency that they appeared in the poorer essays.

The percentages listed in Table 3.20 allow us to begin focusing, in summary fashion, on the crucial differences between

the two groups of E 306 writers, differences indicated by
our analyses of text cohesion. The higher relative percentage
of immediate cohesive ties in the better essays suggests,
among other things, that the better writers tended to establish
stronger cohesive bonds between individual T-units than did
the poorer writers. This conclusion finds a good deal of
support in our previous analyses of reference and conjunctive
cohesion in the two essay sets. It will be recalled from
Table 3.13 that the better writers employed reference cohesion
about twice as often, 84.1 times to 47.8 times, in a text
span of 100 T-units as did the poorer writers. Because the
most significant difference in the occurrence of referential
cohesion between the two essay sets was located in the signifi-
cantly higher frequency in the better essays of personal pro-
nouns (25.1 per 100 T-units as compared to 5.1 for the poorer
writers) and because personal pronouns do not usually span
intervening T-units, we can infer that the better writers
paid considerably more attention to elaborating in subsequent
and immediate T-units items introduced in a given T-unit. Also
figuring importantly in the greater use of immediate cohesive
ties is the frequency with which the better writers employed
T-unit-bridging conjunctions. It is probably accurate to say
that conjunctive ties regularly create immediate cohesive
ties between T-units in succession. It is not, then, surprising
to find, according to Table 3.16 that the better writers used
over three times as many conjunctive ties, 65.40 as compared
to 20.4, per text span of 100 T-units as did the poorer writers.
Not insignificant in this regard is the fact that, as Table 3.16

shows, the better writers employed all types of conjunctive
cohesion while the poorer writers managed to use only three,
and one of those only rarely. Thus it would appear that the
better E 306 writers tended to extend the lexical-semantic
domain established in a given T-unit to an immediately fol-
lowing T-unit considerably more often than did the poorer
writers. One major effect of such lexical-semantic extensions
is, of course, essay length; and it is not surprising that
the essays of the better writers are, on the average, 375.2
words longer than those of their poorer counterparts. Al-
though the typically American notion that "more" is "better"
can be challenged on any number of fronts, it would appear
that the longer essays enjoyed a greater probability of being
rated "high" than did the shorter essays, at least as long
as the "more" was linked through the use of explicit cohesive
ties.

As we pointed out above, the relative percentage of
mediated ties is roughly eight times as large for the better
essays than for the poorer ones. This finding further sup-
ports the notion of extending the lexical-semantic domain of
a given T-unit. Meidated ties, in contrast to immediate
ties, enable a writer to extend the lexical-semantic domain
of a given T-unit into not merely a second succeeding T-unit
but into several succeeding T-units. Judging from the relative
percentage with which mediated ties occurred in the two essay
sets, we must conclude that the better E 306 writers can create
such ties with greater facility than the poorer writers can.

The greater relative percentage of remote-mediated co-
hesive ties for the poorer writers may, at first, seem to
contradict the trend which seems to be developing. And to
some extent it does.. But the higher relative percentage,
36.72% as compared to 25.86%, of remote-mediated ties for
the poorer writers suggests to us an important and funda-
mental difference between the two group of writers. This
higher relative percentage may very well complement that
group's failure to elaborate and extend lexical-semantic
domains through successive T-units and may well suggest that
less "really" new information or semantic content was intro-
duced during the course of a poorer essay than during the
course of a better essay. That is to say, the poorer writers
may have tended more toward reiteration of previously cued
information than did the better writers. Indeed, in reading
the poorer essays one could not help but note what might be
called conceptual and lexical redundancy. Although from
the standpoint of text cohesion a certain amount of redundancy
is a virtue, the "redundancy" in the poorer E 306 may be a
flaw, because the poorer writers provided relatively infre-
quent occasions for immediate and mediated cohesive ties.

The relative percentages of remote ties tends to rein-
force this interpretation. Although the relative percentages
do not differ substantially, 29.69 % for the poorer writers
and 26.94 % for the better writers, they do suggest that the
poorer writers tended more often to reach back across several
T-units in order to recover lexical items. This, coupled
with the smaller relative percentage of immediate and mediated
ties and the higher relative percent‾ e of remote-mediated

ties, may again suggest a greater reliance on a superficial redundancy of concept and lexical item in the "low" quality essays than in the "high quality essays.

Since cohesion analysis of written discourse, student-produced or otherwise, has not the history and tradition of syntactic analyses, it is difficult to say what precisely the implications of the present analysis are for the teaching of writing. In addition, the size of our sample is far too small to allow us to generalize from it with confidence. Yet our analysis does point to certain implications. (1) Without entering into disputes focused on the chronology of the chicken and the egg, we suggest that sophistication in the use of cohesive devices may be directly tied to students' abilities to employ heuristic devices as they explore a given writing topic. That is to say, students with highly developed invention skills have a greater chance of writing better discourse from the standpoint of cohesion than students who do not have such skills. (2) Insofar as cohesion is a theoretical construct having several components addressing different kinds of semantic relationships in texts, it is ipso facto a theory of invention itself and can thus be used as a discovery heuristic. (3) Because cohesion addresses semantic relationships within texts, its major components can and should be used to guide certain of the composing processes of student writers. (4) Because the focus of cohesion is on the types of semantic relationships that obtain across T-units, it can and should be used as a basis for studying the composing and comprehension processes of language users.

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Relating the present study of cohesion in written texts of University of Texas freshmen writers to patterns of cohesion in the writing of other freshmen is no easy matter, because only one such study has been done and in that relatively little information is provided. But in that study (Cooper, et al., 1980) appear a number of figures which allow us to draw some comparisons between the groups of E 306 writers we examined and the group of SUNY-Buffalo students which Cooper, et. al.., examined. These comparisons, however, are based on writing samples of two different kinds, and we suspect that the frequencies and types of cohesion differ according to discourse kind.

Some differences between the two groups of freshmen--the UT freshmen and the SUNY-Buffalo freshmen--with respect to the use of cohesive ties can be seen in general terms, while others can be seen in specific terms.

At the most general level of analysis, the cohesive density of the essays of the two freshman groups does not appear remarkably different. The average number of cohesive ties per 100 T-units for the SUNY-Buffalo population was 488 for the "high" quality papers and 280 for the "low" quality papers. For the UT freshmen about 517 and about 242 cohesive ties per same text span were observed for the "high" and "low" quality groups respectively. While these differences may in part be attributable to variation in mean T-unit length and do not appear to us particularly remarkable, we should emphasize that the "low" quality UT papers exhibited fewer cohesive ties per 100 T-units than did the "low" SUNY-Buffalo papers, while the reverse was true for the "high" quality papers.

At a more specific level, it is possible to say--on the basis of the available SUNY-Buffalo data--that the "high" quality UT papers used nearly eight times as many comparative ties as the "high" quality SUNY-Buffalo papers. This large difference is, however, probably an artifact of the different writing topics--narrative and descriptive on the one hand and argumentative on the other. Niether set of "high" quality papers relied heavily on substitution or ellipsis to achieve cohesion, although the "high" quality UT papers used both with about six times the frequency as the "high" quality SUNY-Buffalo papers. This difference may also be attributed to writing topic variation. Also likely attributable to topic variation are the large differences between the two sets of essays along the dimension of total conjunctive ties. The writers of the "low" quality SUNY-Buffalo papers used 16 such ties per 100 T-units, while the writers of the "high" quality papers used about 17. However, for the UT essay set, about 20 and 65 conjunctive ties were observed in the "low" and "high" papers respectively.

The "high" and "low" quality papers of the two populations also differed with respect to their reliance on lexical cohesive ties. While same-item lexical ties constitute about 65% and 50% of all lexical ties for the "low" and "high" quality papers, respectively, for both freshman populations, differences between the two populations are most obvious along the dimension of lexical collocation. Whereas the percent of total lexical ties represented by collocation in the "low" quality SUNY-Buffalo papers was 32%, in the "low" quality UT papers

only about 20% of the total lexical ties were collocative.
Similarly, whereas collocative ties represented 41% of all
lexical ties in the SUNY-Buffalo papers rated "high," only
about 32% of all lexical ties in the "high" quality UT papers
were collocative. While these differences may simply be
attributable to the respective writing topics, we suggest
that the greater relative use of collocation in the SUNY-Buffalo
papers may reflect the generally higher verbal abilities of
the SUNY-Buffalo students from whom the writing samples were
taken.

3.5 Errors, Syntax, Personal Pronouns, and Cohesion in E 306 Essays: A Conclusion

The analyses of certain features of "high" and "low"
quality E 306 essays point to some major differences in the
writing behaviors of the two groups of students. These analyses
also suggest that in many ways the writing skills of E 306 stu-
dents are as well developed or better developed than the skills
of college freshmen at other institutions. Certainly the gross
measurements of syntax suggest that the UT students write with
a command of syntax comparable to that of students at other
institutions. The more specific analyses of syntactic features,
however, probably indicates that at least for the writers of
the "low" quality papers instruction in the use of final non-
restrictive modifiers would be productive. With respect to
error frequencies, the UT students in general appear superior
to certain other groups of college freshmen for whom data were

available, suggesting that greater attention in E 306 classes
to error reduction may not be necessary. This suggestion
finds support in the analyses of language mechanics presented
in Chapter 4 and Chapter 5 of this report. The differences
between the uses of first- and second-person pronouns in the
"high" and "low" quality essays suggests that E 306 students,
especially the writers of the "low" quality papers, need help
developing a arper sense of the relationships that exist
among writer, audience, and subject matter in written discourse.
Finally, our analyses--of essay length and cohesion--suggests
that the poorer E 306 writers need systematic instruction in
invention, a skill which, as Chapter 4 and Chapter 5 suggest,
may be best taught in the "synthetic" curriculum.

CHAPTER 4

E 306 CHANGE SCORES AND FIVE DERIVATIVE
COMPARISONS

In the first chapter of this report, we identified the
general purpose of the present study and, in so doing, indicated
the major differences between the two principal E 306 options
we wished to compare. In Chapter 2, we introduced the research
design, a design which would allow a large number of curricular
and instructional-variables to be controlled and thereby studied
systematically. In Chapter 2, we also outlined the procedures
employed for collecting and analyzing data in the form of essays
and in the form of responses to objective tests; and we specified
the sample population studied. In the third chapter, we examined
in considerable detail some of the differences between "high
quality" and "low quality" E 306 essays written on the A_1 writing
topic (see Chapter 2). In this, the fourth chapter, we analyze
and compare a number of curricular and instructional components
of the two major E 306 options.

Our purpose in the present chapter is thus a dual one:
(1) to determine, as far as possible with data at hand, whether
E 306 is an educationally effective course in writing and (2)
to begin to identify those curricular and instructional compo-
nents which appear most efficacious in teaching composition to

E 306 students. To achieve this dual purpose, we will, first, examine the changes across time observed in the writing and in the writing-related behaviors of all 180 students we selected from the 20 sections of E 306 used in the present study. Second, we will evaluate different E 306 components by comparing the instructional and curricular options previously specified in Table 2.2. These analyses will provide part of the basis for a set of recommendations for improving writing instruction in E 306 (see Chapter 8).

4.1 Changes in Writing and Writing-Related Behaviors.

Although the relative effectiveness of different instructional and curricular variables raises questions both interesting and important, a necessary prior question focuses on the combined effectiveness of all instructional and curricular options for E 306 which contribute to the principal and derivative comparisons specified in Table 2.1 and Table 2.2. The present section describes the pooled data for all 20 E 306 sections studied, focusing on the changes which occurred across one semester of composition instruction. First, we will treat the changes observed between the two pretest essays and the two posttest essays collected from each of the 180 students selected for study. Second, we will examine changes in writing-related skills and abilities, as observed across the same period and as measured by responses to objective tests.

Changes Identified by the Pre- and Posttest Essays. As
we pointed out in Chapter 2, the 180 students chosen for the
present study each completed two pretest essays and two posttest
essays. One pretest essay and one posttest essay were written
on the A_1B_1 topics presented in Chapter 2. Half of the students
wrote on the A_1 topic and half on the B_1 topic as a pretest;
for the complementary posttest essays, the topics were simply
reversed. One pretest and one posttest essay were also written
on the A_2B_2 topics, which were also presented in Chapter 2.
Adminstration of these topics followed the same procedures
used in the administration of the A_1B_1 topics.

As indicated in Chapter 2 and Chapter 3, these four essays
from each of the 180 students were analyzed for total number of
words, mean T-unit length, mean clause length, the ratio of
T-units with final free modifiers to the total number of T-units,
and the ratio of words in final free modifiers to the total
number of words. When the decimal is moved two places to the
left, these two ratios become percentages. In Chapter 3 a
history of the four syntactic indices was presented, together
with rationales for their use in the present study. Also as
stated in Chapter 2, the essays were submitted to single-impres-
sion holistic evaluations by experienced teachers of college
writing. The descriptive data which derive from the word-length
analyses, the syntactic analyses, and the holistic evaluations
of the 720 essays and the results of paired T-tests of the
changes across time are reported in Table 4.1.

Insert Table 4.1 about here.

As Table 4.1 indicates, the means for the total number of words and for the syntactic indices on the A_1B_1 pretest and the A_1B_1 posttest essays do not differ significantly, the computed t-values failing to reach statistical significance at the .05 level. However, the means for the corresponding holistic rating, which represent the means for the two summed ratings (see Chapter 2), differ significantly beyond the .001 level of probability. Thus even though none of the length features of the essays elicited by the A_1B_1 topics changed significantly over a semester, the overall quality of the writing did. This latter change finds corroboration in Table 2.3, which lists the distribution of holistic scores across the four scoring categories, and Table 2.4, which lists the percentage of scores falling in each scoring category. As Table 2.3 and Table 2.4 illustrate, over 10% fewer scores of "1" and "2" were awarded the posttest A_1B_1 essays than were awarded the pretest A_1B_1 essays, while approximately 3% more scores of "3" and 8% more scores of "4" were awarded the posttest A_1B_1 essays than the pretest essays on the same topics. These higher frequencies of posttest scores falling into the two higher scoring categories account for the 0.49 improvement in writing quality over the course of the semester.

While significant change between the pretest-posttest means for A_1B_1 essays was observed only for the holistic ratings given the essays, on the A_2B_2 topics differences between the

pre- and posttest means along three of the six dimensions are
statistically significant--average word length of the essays,
the ratio of total words used in final free modifiers to the
total number of words, and mean holistic rating. The ratio of
T-units containing final free modifiers to total T-units
approached statistical significance but did not reach the .05
level of confidence. As with the difference between the pre-
and posttest means for T-unit length and clause length for the
A_1B_1 essays, the difference between the pre- and posttest means
was too small to reach statistical significance.

The descriptive data and the statistical tests presented
in Table 4.1, even though they do not address the question of
the relative effectiveness of one or another E 306 option, are
important for a number of reasons.

First, and certainly most important, these data and statis-
tical tests strongly suggest that taken as a unit the 20 E 306
sections studied represent 20 educationally valid classes: the
overall quality of the writing of E 306 students is demonstrated
to have improved significantly over the period of one semester
of college writing instruction. Given two holistic ratings
ranging from 1 to 4 which were summed to produce a possible
scoring range from 2 to 8 for each essay, Table 4.1 indicates
that on the average each A_1B_1 posttest essay was one-half of a
point better in quality than its pretest counterpart. The
average observed change from the A_2B_2 pretest essays to the
corresponding posttest essays was even larger, with each A_2B_2
posttest essay nearly three-quarters of a point better than its

pretest counterpart. Because the principal goal of E 306 is to teach students to write better and because there is no reason to believe that the 180 students we studied were any better as writers at the beginning of the semester than E 306 students in general, these highly significant gains in essay quality suggest that E 306 classes in general achieve their major goal. And it is important to note in this connection that although positive change in essay quality would have been acceptable at the .05 level of confidence, the positive change in quality for both the A_1B_1 and the A_2B_2 is significant beyond the .001 level.

The descriptive data reported in Table 4.1 are important for yet another reason: they strongly suggest that the two sets of essay topics actually did elicit essays which differ in kind from each other. This suggestion finds support when the mean T-unit lengths and the mean clause lengths of the essays based on the A_1B_1 topics are compared to the corresponding means of the essays based on the A_2B_2 topics. Such a comparison reveals that the A_1B_1 topics elicited T-units on the pretest essays that were on the average 1.70 words shorter than those elicited on the pretest essay written for the A_2B_2 topics. A somewhat smaller difference--1.56 words--obtains between the mean T-unit lengths of the posttest essays. A similar difference is also observed between the mean clause lengths elicited by the two sets of essay topics: the mean clause length's of the pretest essays differ by 1.62 words, and the means for the posttest essays differ by 1.37 words. As was pointed out earlier, the A_1B_1 topics were

those used in the Miami University sentence-combining experi-
ment\and were "devised" specifically in "invite descriptive
and narrative supporting details" (Morenberg, et al., 1978,
p. 246). The A_2B_2 topics, on the other hand, were designed by
Cameron and Witte to elicit argumentative discourse from the
students·who were involved in the present study. That differ-
ences along the dimensions of mean T-unit length and mean clause
length should obtain across the two sets of writing topics
strongly suggests that the two sets of topics did in fact elicit
written discourse of two different kinds. This suggestion draws
on the findings of several previously published studies. Witte
and Davis (1980a) have recently pointed out that such syntactic
differences among discourses written in different discourse modes
"have been known to exist at least since Frogner (1933) and
Seegars (1933), whose findings have been, to some extent, con-
firmed . . . by Kincaid (1953), Marckworth and Bell (1967),
Johnson (1967), Bortz (1969), Veal and Tillman (1971), Perron
(1977), and Crowhurst (1978)." Many of the more recent studies
(e.g., Perron's and Crowhurst's) have used mean T-unit length
and mean clause length to distinguish discourse written in
different modes, typically the four traditional modes--narration,
description, exposition, and argumentation. Research in this
area points to the conclusion that argumentative discourse
employs longer clauses and T-units than discourse written in
the other three traditional modes. Certainly, the clauses and
the T-units elicited by the A_2B_2 topics in the present study are
appreciably longer than those elicited by the A_1B_1 topics, thus

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suggesting that the kinds of discourse the topics were supposed
to elicit from the students were in fact elicited.

The data reported in Table 4.1 for mean clause length and
mean T-unit length are also important because they allow us to
compare the syntactic development of beginning E 306 students
to that of other college students and to that of writers of
different ages. A similar comparison, based on the five essays
rated "high" in quality and the five essays rated "low" in
quality was made in Chapter 3; here, however, with an N of 180
instead of an N of 10 and with reference to both sets of essays
instead of one type of essay from the A_1B_1 essays, we offer a
comparison more reliable in direct proportion to larger number
of cases. To facilitate this comparison, the pretest means for
clause length and T-unit length for both sets of essays collected
for the present study have been placed in the context of "norma-
tive" means previously reported for different age groups, ranging
from third graders to skilled adult writers who had published
in magazines like Harper's. The context of "developmental
norms" for these two syntactic indices appears in Table 4.2.

Insert Table 4.2 about here.

Table 4.2 strongly indicates that as a group the 180 E 306
writers wrote clauses and T-units whose mean length fit well into
the developmental continua suggested for both indices. The
mean T-unit lengths--15.26 and 16.96, respectively--for both

sets of essays are greater than the means Hunt (1965) reported
for twelfth graders and smaller than those for the skilled
adult writers studied by Cooper, et al. (1980), Hunt (1965),
and Faigley (1979a). So too with the mean lengths of the clauses
the 180 E 306 students wrote: the average clause lengths of
8.92 words and 10.54 words for the two sets of essays are both
greater than the 8.60 words Hunt (1965) reported for twelfth
graders and smaller than the means Cooper, et al. (1980), Hunt
(1965), and Faigley (1979a) reported for skilled adult writers.

It is also instructive to compare the mean lengths of T-units
and clauses written by E 306 students to those reported for
freshmen at other universities. As Table 4.2 indicates, both
the average T-unit length and the average clause length of the
E 306 writers for both essay sets exceeds the means reported
for North Dakota freshmen (Failgey, 1979b), New Brunswick fresh-
men (Stewart, 1978a), and Oklahoma freshmen (Sodowsky and Witte,
1978). The two sets of means for the E 306 students, however,
fall on either side of the means reported by Cooper, et al.
(1980) for SUNY-Buffalo freshmen. Although some of the differ-
ences among the means for the various college freshman popula-
tions is assuredly attributable to differences in types of
written discourse produced, there is no reason to think that
from the standpoint of the development of syntactic complexity,
the UT students lag behind their counterparts at other universi-
ties. Indeed, if these indices for measuring syntactic complexity
are reliable as developmental indices (see O'Donnell, 1976,
and Hunt, 1977, for arguments suggesting reliability; and see

Witte, 1979, and Witte and Davis, 1980 and in press, for questions
regarding the reliability of these indices), then it is possi-
ble to say that from a developmental point of view, the UT
students are above average with respect to the development of
syntactic complexity.

One additional point needs to be made about the means and
the change scores reported in Table 4.1. As was pointed out
above, the mean length of clauses and T-units for neither set
of E 306 essays increased significantly over the course of one
semester. Given the highly significant gain scores reported
for these indices for the experimental groups involved in Faigley's
(1979 b and c) study of generative rhetoric, Stewart's (1978b) study
of sentence combining, and the Miami University trio's (Daiker,
et al., 1979; Moreneberg, et al., 1979) study of sentence com-
bining, one might be inclined to wonder whether the E 306 courses
had any effect at all on the syntactic abilities of their stu-
dents. However, it should be pointed out that while significant
changes for experimental groups have been reported along these
dimensions in a host of sentence-combining experiments and in
a few studies of the influence of generative rhetoric, in vir-
tually all instances the change scores along these same dimensions
for the respective control groups have indicated either a net
loss or a statistically non-significant gain. This suggests
that unless students undergo an instructional treatment designed
specifically to increase the mean lengths of clauses and T-units,
they are not likely to increase the mean lengths of the clauses
or T-units they write. Given the previous investigations of

Witte and Davis (1980, in press) on the question of stability of T-unit length, it is even possible to hypothesize that the net losses and the insignificant gains for the various control groups involved in studies designed to promote longer T-units and clauses signal an increased stability along these dimensions in the writing of the control groups.

That the E 306 students failed to realize statistically significant gains along these two dimensions also needs to be placed in the context of two studies which attempted to identify syntactic predictors of writing quality. Neither the study done by Nold and Freedman (1977) nor the study done by Faigley (1979c) indicates that when mean T-unit length and mean clause length are considered as predictors of holistic scores, they fail to account for any significant amount of the variance among the holistic scores. These latter findings are altogether compatible with the results of the T-tests reported in Table 4.1, where statistically significant change is shown to have occurred along the dimension of writing quality for both sets of E 306 essays but not along the dimensions of the two indices of syntactic complexity in question. On the whole issue of predictors of writing quality, we will have much more to say in Chapter 7. For the present, it is sufficient to conclude that these two syntactic indices appear to be useful only as extremely gross indicators of the development of syntactic complexity.

Changes Identified by Scores on Objective Tests. In addition to the measures tied directly to the four essays that each of

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the 180 E 306 students wrote, we also attempted to measure
with a series of objective tests changes along the dimensions
of certain writing-related behaviors. The instruments we used
were the McGraw-Hill Writing Test, Forms A and B; the McGraw-
Hill Reading Test (reading comprehension part only), Forms A
and B; and the Daly-Miller Writing Apprehension Test. As with
the two sets of writing topics, these instruments were used both
as pretests and as posttests. In the case of the two McGraw-
Hill tests, half of the students were given Form A as a pretest
and half were given Form B; for the posttest the two forms were
simply reversed; but the same form of the Daly-Miller Writing
Apprehension Test was used as both the pretest and the posttest.

The McGraw-Hill Writing Test reportedly "measures the
students' skills in written communication" (Raygor, 1970b, p. 7).
Both forms of the test consist of three sections--one devoted
to language mechanics (30 items), one devoted to sentence patterns
(26 items), and one devoted to paragraph patterns (15 items).
These sections of the McGraw-Hill Writing Test were administered
sequentially as separate tests and students were allowed 15
minutes to complete each section. Raygor (1970b, p. 7) describes
the three sections of the Writing Test as follows:

> Part I - Language Mechanics consists of two short
> compositions, each of which contains 15 underlined
> words or phrases. The student must decide whether
> the underlined material is correct or contains one
> of the errors listed in the following key:

C   error in CAPITALIZATION

P   error in PUNCTUATION

G   error in GRAMMAR

N   NO ERROR

Part II - Sentence Patterns contains a variety of item types. The student must identify sentence types according to the key below:

A   Sentence Fragment

B   Simple Sentence

C   Compound Sentence

D   Complex Sentence

He must then examine items which contain four sentences to decide which one is grammatically correct. Finally, he must link together sentences in a short passage by choosing from four given connecting or transition words the one most appropriate in the context of the whole passage.

Part III - Paragraph Patterns contains items which represent paragraphs and require the student to recognize the relationship between the sentences in a paragraph in terms of development of thought. The student's task in some items is (1) to choose the appropriate topic sentence for a paragraph, (2) to choose the appropriate developing sentences for a given topic sentence, and (3) to choose the appropriate

concluding sentence for a paragraph. In
working other items, the student must
determine which sentence in a paragraph
is out of order. Finally, he is to read
through groups of sentences in order to
indicate where each group should be
divided into paragraphs.

Each of these three sections of the Writing Test generates
a separate score, each score having a possible range from zero
through the total number of items included in a given section.
Collectively, the three sections of the Writing Test yield a
total possible raw score of 71.

Although the total possible raw score is the same for both
forms of the McGraw-Hill Writing Test, Form A appears to be
slightly more difficult than Form B. This difference in level
of difficulty is reflected in the means and standard deviations
reported by Raygor (1970b, p. 26) for the norming group data.
These means and standard deviations appear in Table 4.3.

Insert Table 4.3 about here.

According to Raygor (1970b, p. 26), the "norming group included
(1) freshmen (and a few sophomores) in four-year colleges and
universities; (2) two-year college students; and (3) 'college-
bound' high school juniors and seniors." Depending on the
particular form and section of the test, the number of the

students in the norming group ranged from 1,171 to 1,204; and
the normative data were apparently collected during the 1969
academic year. As Table 4.3 indicates, the difference between
the mean scores for the two forms is 1.90 points, suggesting
that Form B of the test is somewhat less difficult than Form A,
especially as concerns the section on language mechanics. To
accommodate for the apparent difference in levels of difficulty
between the two forms of the test, the split-halves method of
administration noted earlier was employed.

Inasmuch as the "analytic" curriculum underlying many of
the E 306 options we examined has a secondary goal the improve-
ment of students' abilities in comprehending written material,
we also administered the "Paragraph Comprehension" section of
the McGraw-Hill Reading Test, Forms A and B. Raygor (1970a,
p. 7) describes this section of the Reading Test in the follow-
ing way:

> Paragraph Comprehension contains five long
> reading passages. Each of the five items
> following each passage measures one of the
> following five comprehension skills:
>
> 1. Recognition and understanding of the
>   main idea
>
> 2. Recognition of specific facts and under-
>   standing their importance and function
>
> 3. Recognition and understanding of general
>   scientific principles in both the physi-
>   cal and social sciences

4. Discovery of paragraph organization
and structure

5. Critical evaluation of the author's
writing: discrimination of fact from
opinion, recognition of tone and intent,
and judgment of validity of arguments.

Interspersed among the five longer passages are
five short paragraphs with one item each. The
latter items measure factual knowledge and are
similar to what a student can expect to encounter
in an objective test based on a course textbook.
The other two sections of the Reading Test--reading rate and
comprehension and skimming and scanning--were not administered
simply because of the large chunk of the semester's time that
had to be committed to testing in connection with other aspects
of the present study; administering the complete Reading Test
would have required a minimum of 66 minutes of class time, thus
requiring that portions of two class periods in a MWF class
would have had to be devoted to the Reading Test alone.

According to Raygor (1970a, p. 30), the "norming group
(N = 1,526 for Form A; N = 1,526 for Form B) included approxi-
mately equal numbers of (1) freshmen (and a few sophomores) in
four-year colleges and universities, (2) two-year college students,
and (3) 'college-bound' high school juniors and seniors. As
with the norming data for the McGraw-Hill Writing Test, the
norming data for the Reading Test were apparently collected in
1969. As with the two forms of the Writing Test, Form A of the

paragraph comprehension section of the Reading Test appears
to be slightly more difficult than Form B, but not significantly
so in this case. This conclusion is based on a comparison of
the means and standard deviations presented in Table 4.4 for
the two forms of the Paragraph Comprehension section. As
Table 4.4 indicates, the means for the two forms of the

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Insert Table 4.4 about here.
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paragraph comprehension section differ by only 0.64 points
along a possible scoring range of zero to 30. Nevertheless,
the same split-halves procedure was employed in the administra-
tion of the paragraph comprehension section of the Reading Test
as was employed in the administration of the two sets of
writing topics and in the administration of the Writing Test.

One additional point should be made regarding the paragraph
comprehension section of the McGraw-Hill Reading Test: it
correlates quite highly with the vocabulary, comprehension, and
total score scales of Form B of the Nelson-Denny Reading Test,
revised edition. The respective Pearson product-moment corre-
lation coefficients reported by Raygor (1970a, p. 32) are as
follows: 0.59, 0.54, and 0.61.

While it is not our purpose in the present section of this
report to explore the relationships that may or may not exist
among these objective measures of writing-related skills (that
issue will be taken up in a subsequent chapter), we will assume

for the time being that some relationship does exist; and our examination in subsequent portions of the present chapter of the change scores generated with these instruments will reflect that assumption.

The final objective instrument employed in the present study was the Daly-Miller Writing Apprehension Test (WAT). The WAT measures neither writing abilities nor writing-related skills. Rather it attempts to assess the degree of anxiety or apprehension with which writers approach writing tasks. Inasmuch as none of the sections of E 306 we examined for the principal and derivative comparisons specified in Table 2.1 and Table 2.2 appear to have affected writing apprehension, either by increasing it or decreasing it significantly, we will only note the change scores for writing apprehension in the present chapter. However, we do devote an entire chapter later in this report to the relationship between writing appre-hension and writing abilities.

The changes observed along the dimensions of these objective tests for the 180 E 306 students, for whom we have already discussed observed changes in two pretest and two posttest essays, are presented in Table 4.5. As Table 4.5 reveals, while no significant changes appeared along the dimensions of the

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Insert Table 4.5 about here.
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paragraph patterns section of the Writing Test and of the WAT,

highly significant changes occurred along the dimensions of
the language mechanics section and the sentence patterns
sections of the Writing Test and along the dimension of para-
graph comprehension section of the Reading Test. The gain
scores on the language mechanics and the sentence patterns
sections of the Writing Test are shown to be significant beyond
the .002 level of confidence, gains which make the changes on
the total score of the Writing Test also significant beyond the
.001 level of confidence. Given the assumption that some
relationship exists between performance on an objective measure
of writing skills and actual writing behavior, the higher post-
test scores corroborate the changes presented in Table 4.1:
the writing abilities, whether measured on essays or on objec-
tive tests, of the 180 students appear to have improved over
the course of one semester of writing instruction. The gain
scores, although less significant from a statistical point of
view, on the paragraph comprehension section of the Reading
Test are equally impressive since the improvement of reading
ability is a secondary goal of E 306 classes. These gains,
significant well beyond the acceptable level of .05, are
especially impressive when it is remembered that the "synthetic"
curriculum sections in the present study made no use of a reader.
The data, together with the paired T-tests, presented in Table
4.5 offer additional evidence to suggest that E 306 is an educa-
tionally valid course.

4.2 The Five Derivative Comparisons

In Chapter 2, we noted that the research proposal for the present study called for five specific comparisons of E 306 options in which curricular, instructional, and teacher variables were controlled within each comparison. These comparisons, which we labelled the "principal comparisons," are delineated in Table 2.1 in Chapter 2. We also pointed out in Chapter 2 that by removing the controls on the teacher variable and on either a curricular or an instructional variable controlled in the principal comparisons, we could create five "derivative comparisons." Some of these comparisons result in the pairing of instructional or curricular variables not paired in the five principal comparisons, and some merely result in similar comparisons but with a larger number of students because of the removal of the teacher variable.

Each derivative comparison draws on the same data set discussed in the previous section; but each derivative comparison utilized either different combinations of data subsets or different data subsets. The use of different subsets of the E 306 data in the five derivative comparisons will help us identify which curricular and instructional variables had the greatest effect on the changes reported in the previous section. Unlike the five principal comparisons wherein each cell in each comparison is comprised of an equal number (18) of cases, the cells created for the derivative comparisons do not involve equal numbers of cases.

It is to these derivative comparisons that we now turn.

Derivative Comparison 1: All "Analytic-Conventional" Classes Compared with All "Synthetic-Conventional" Classes. This comparison is similar to Principal Comparison 1 in that both test for the effect of curriculum on student writing and writing-related behaviors and skills. The crucial difference between the present comparison and Principal Comparison 1 is that here the number of cases in the "analytic-conventional" classes is 90 rather than 18. The larger N for the present comparison is a direct result of the removal of controls on the teacher variable, thus allowing more classes and more students to be used in the comparison. Because only two of the 20 sections involved in the study were "synthetic-conventional" classes, the N for that component of the present comparison obviously could not be increased.

Before turning to tests of the effect of curriculum on achievement, it is necessary to determine whether the classes on either side of the present comparison registered significant gains during the semester along the twelve dimensions associated with the four essays each student wrote and along the six dimensions associated with the series of objective tests which were administered pre and post. Table 4.6 presents the descriptive data of the pre and post means for the two sets of essays written by the "analytic-conventional" students and the results of T-tests of the observed changes across the period of one semester of writing instruction. Table 4.7 presents the same kinds of information, but for the students in the "synthetic-conventional" classes.

Insert Table 4.6 about here.

Insert Table 4.7 about here.

Some noteworthy differences between the two groups of students appear in Table 4.6 and Table 4.7. As Table 4.7 indicates, students in the "synthetic-conventional" sections showed significant gains along the dimensions of the ratio of T-units with final free modifiers to total T-units and the ratio of words in final free modifiers to total words for the A_2B_2 set of essays; and they showed gains which approached significance along the dimensions of two other syntactic indices. However, the gains for the holistic scores were not statistically significant. Table 4.6, on the other hand, indicates that the "analytic-conventional" students wrote essays on both sets of writing topics which were significantly better at the end of the semester than they were at the beginning. Table 4.6 also indicates that none of the syntactic indices showed gains across the semester that were statistically significant for this group. Although the two tables taken together would seem to suggest that the "analytic-conventional" students outperformed the "syntactic-conventional" students along the dimensions of the two holistic scores--the dimensions which we said earlier must be regarded as the most important--a comparison of the gain scores for the two groups reveals that the change between the pre- and posttest

holistic scores for the "synthetic-conventional" students on the A_1B_1 topics was actually greater than for that of the "analytic-conventional" students. An even greater difference, again favoring the "synthetic-conventional" students appears for the A_2B_2 topics. Interestingly enough, the gains along the dimensions of the two holistic scores for the "synthetic-conventional" classes either exceeds or equals those reported for all E 306 students studied (see Table 4.1), gains found to be highly significant. This apparent discrepancy is actually no discrepancy at all, for statistics is the science of probability and high probabilities are difficult to project on the basis of a small number of cases. Thus the probabilty of smaller gains not being attributable to chance alone for a larger number of cases is greater than the probability of larger gains based on a smaller number of cases being attributable to chance. The problem of the small N of cases is one which recurs frequently in the analyses associated with the five principal comparisons presented later in this report as well as in the analyses associated with subsequent derivative comparisons.

The same problem also points to the virtual impossibility of inferring from a comparison of significance levels the relative effectiveness of one or more instructional or curricular components. To make such inferences it is necessary not only to take into account in a systematic way the differences between the pre- and posttest means, but also to accommodate the variance among the scores within the respective populations being studied. An analysis of covariance provides an analytic

paradigm which allows all such relevant factors to be accommo-
dated so that reliable inferences can be made regarding the
effects of particular treatments on the populations being
studied. Hence we employed analyses of covariance as the bases
of our comparison of the two curricula taught in a conventional
classroom setting. As Table 4.8 reveals, neither the "analytic-
conventional" classes nor the "synthetic-conventional" classes
can be judged to be more effective than the other in causing
changes in posttest A_1B_1 essays. This is not to say that no

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Insert Table 4.8 about here.
_____

changes occurred during the span of one semester, but it is to
say that one treatment was no more effective than the other in
producing those changes.

A somewhat different situation arises with respect to the
change scores observed for the A_2B_2 topics. As Table 4.9 indicates,

_____

Insert Table 4.9 about here.
_____

there was a statistically significant curricular effect on the
pre- to posttest changes in mean number of words, in the ratio
of T-units with final free modifiers to total T-units, and in
the ratio of words in final free modifiers to total words. By
referring back to Table 4.6 and Table 4.7, we can observe that

the "synthetic-conventional" classes produced change scores along these dimensions that were statistically significant and that were greater than those computed for the "analytic-conventional" classes. We can, therefore, infer from the analyses of covariance presented in Table 4.9 that the synthetic curriculum actually effects such changes in student writing.

The "analytic-conventional" and the "synthetic-conventional" classes involved in the present comparison can also be compared along the dimensions of the several objective measures which the students completed. The pre- and posttest means and the results of paired T-tests of the changes across time for the two groups are presented in Table 4.10 and 4.11, respectively.

Insert Table 4.10 about here.

Insert Table 4.11 about here.

As Table 4.10 indicates, the students in the "analytic-conventional" sections achieved significant gains along the dimensions of language mechanics, total writing score, and reading comprehension. The first two of these were statistically significant beyond the .001 level of confidence while the latter was significant beyond the .004 level. The students in the "synthetic-conventional" sections, in contrast, realized no significant

gains along the dimensions of reading comprehension--not an unsurprising finding since those students had no reading component in the curriculum they studied--but did realize significant change along all the dimensions of the McGraw-Hill Writing Test. Three of the four change scores, as Table 4.11 shows, reached statistical significance well beyond the .01 level of confidence. One of the change scores, the one for the paragraph patterns portion of the Writing Test, reached statistical significance beyond the .02 level of confidence. However, this change was in a negative direction; that is to say, the students actually regressed along this dimension during the time separating the pretest and the posttest. This regression is somewhat surprising given the amount of attention the students enrolled in the "synthetic" curriculum would have devoted to the study of the paragraph as a microcosm of the whole essay. The highly significant gains along the dimensions of language mechanics and sentence patterns should not, on the other hand, be surprising at all, given the close attention paid to the sentence and to matters related to the sentence in the "synthetic" classes. Obviously, the gains on the total writing score are a function of the significant gains on the two of three sections of the Writing Test. Writing apprehension, as measured by the WAT administered pre and post, changed significantly for neither group.

To determine whether one curriculum could be said to have been more effective than the other in producing the observed change scores, we again ran analyses of covariance to test for

the effect of curriculum. As in the previous covariance analyses, the pretest scores, this time for all dimensions reported in Table 4.10 and Table 4.11, were entered into the analyses as covariates. As Table 4.12 shows, a significant curriculum

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Insert Table 4.12 about here.

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effect was found only for the performances on the sentence patterns section of the McGraw-Hill Writing Test. When the change scores for this dimension for both groups (see Table 4.10 and Table 4.11) are taken into account, it is possible to conclude that along this one dimension, the "synthetic-conventional" curriculum was more effective than the "analytic-conventional" curriculum.

Given our analyses in the present section, it is possible to highlight what appear to be curriculum effects on the performances of E 306 students. First, neither the "analytic" nor the "synthetic" curriculum when taught in a conventional classroom setting seems to be more effective than the other in producing significant and positive gains in writing quality for either of the two sets of essays. Both curricula appear to be effective in this regard, even though the gain scores for the "synthetic" classes did not reach statistical significance when they were submitted to paired T-tests. Second, although neither curriculum proved to be more effective than the other in producing the change scores observed for the A_1B_1 essays, the "synthetic" curriculum did prove to be more effective in producing changes

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along the dimensions of mean number of words per essay, the ratio of T-units having final free modifiers to total T-units, and the ratio of words in final-free modifiers to total words for the A_2B_2 essay. At this point, these findings suggest to us that the "synthetic" curriculum, in spite of demanding fewer essays of its students, managed to teach "invention" skills in such a way that the students were able to generate significantly more "content" on the A_2B_2 posttest essays than were the students in the "analytic" courses. These findings also suggest that the "synthetic" curriculum taught students to write syntactic structures which have been shown by Nold and Freedman (1977) and Faigley (1979c) to predict a significant amount of the variance among holistic scores. On this matter, we will have much more to say in a subsequent chapter. Finally, the "synthetic" curriculum produced gains along the dimensions of the sentence patterns sections of the McGraw-Hill Writing Test, gains which are probably compatible with the gains along the two syntactic indices which measure the occurrence of final free modifiers.

Derivative Comparison 2: All "Analytic-Conventional" Classes Compared with All "Synthetic-Tutorial" Classes. This comparison is similar to Derivative Comparison 1 in that the "synthetic" and "analytic" curricula are again compared. However, the present comparison controls for neither the teacher variable nor the instructional variable as rigorously as they are controlled in other comparisons (see Table 2.1 and Table 2.2). Differences both in terms of curriculum and in terms of

instructional method are involved in this comparison. In this comparison, we studied the same group of "analytic-conventional" students used in the previous comparison, but here we compare their performances in E 306 with those of all students enrolled in the "synthetic-tutorial" classes, regardless of whether those classes used computer-assisted instruction or not. That is to say, in this comparison the data for the "synthetic-laboratory-tutorial" classes (sections 12 and 04) and the "synthetic-tutorial" classes (sections 21 and 03) are pooled.

The change scores for the "analytic-conventional" classes used in this comparison were presented in Table 4.6 and Table 4.10, and their respective significances were discussed above in connection with Derivative Comparison 1. The change scores for the four "synthetic-tutorial" sections used in the present comparison are presented in Table 4.13 and Table 4.14.

Insert Table 4.13 about here.

Insert Table 4.14 about here.

Table 4.13 presents the change scores for the two sets of essays, and Table 4.14 presents the change scores for the objective measures of writing-related behaviors. As Table 4.13 illustrates, the changes along the dimensions of the holistic scores for the two essay sets failed to reach significance at the .05 level

of confidence, although the change scores for the A_2B_2 essays did approach statistical significance at the .069 level. It must, however, be noted that the observed positive change of 0.47 for the A_1B_1 essays is only 0.02 of a point short of the gains which were found (see Table 1) to be statistically significant for the entire group of 180 ∴ 306 students. Also, the change along the dimensions of holistic scores for the "synthetic-tut. ial" students on the A_2B_2 essays actually exceeds the highly significant gains reported for all 180 students (see Table 4.1). Again the problem of the small N appears.

Notice that the change in holistic score for the A_1B_1 essays for the "synthetic-tutorial" classes is 0.19 of a point smaller than that for the "analytic-conventional" classes. For the A_2B_2 essays just the opposite is true, with the holistic change score for the "analytic-conventional" classes being 0.17 of a point smaller than that for the "synthetic-tutorial" classes. Some of the change scores for the "synthetic-tutorial" classes did, however, reach significant levels. As Table 4.13 shows, the "synthetic-tutorial" A_1B_1 posttest essays were significantly longer than their pretest counterparts, as were the A_2B_2 posttest essays, although the level of significance was not as high in the latter case. Significant changes also occurred between the pretest and posttest essays written on the A_2B_2 topics along the dimensions of the ratio of T-units with final free modifiers to total T-units and the ratio of words in final free modifiers to total words. These changes are consistent with those observed for the "synthetic-conventional" classes examined in the

previous comparison.

Also consistent with the changes observed previously for
the "synthetic-conventional" classes are the changes reported in
Table 4.14 for the "synthetic-tutorial" classes. As Table 4.14
indicates, the "synthetic-tutorial" group, although not achiev-
ing significant gains along the dimension of the paragraph
patterns section of the McGraw-Hill Writing Test, did realize
significant gains along the dimensions of language mechanics,
sentence patterns, and total score on the Writing Test. These
gains are consistent with those reported previously for the
"synthetic-conventional" classes. Again, however, the "synthetic"
classes in the present comparison failed to realize significant
improvement in reading comprehension over the course of the
semester while their counterparts in the "analytic-conventional"
sections did (see Table 4.10).

Using the data reported in Table 4.6, Table 4.10, Table
4.13, and Table 4.14, we again employed analyses of covariance
in order to determine whether either of the two courses repre-
sented in Derivative Comparison 2 was more effective than the
other. These analyses are presented in Table 4.15, Table 4.16,
and Table 4.17.

Insert Table 4.15 about here.

Insert Table 4.16 about here.

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Insert Table 4.17 about here.

Table 4.15 indicates that for the A_1B_1 essays neither course can be judged better than the other in effecting significant changes along the dimensions of mean clause length, mean T-unit length, ratio of T-units with final free modifiers to total T-units, ratio of words in final free modifiers to total words, or holistic score. The effect of curriculum and instruction on the holistic scores did, however, approach statistical significance at the .064 level of confidence. The higher mean score for the "analytic-conventional" classes on the A_1B_1 posttest essays was nearly high enough to register as a statistically significant course effect. The posttest mean for the "analytic-conventional" classes was a full three-fourths of a point higher than the posttest mean for the "synthetic-tutorial" classes. The "synthetic-tutorial" course did, however, have a significant effect (significant beyond the .009 level of confidence) on the total number of words written on the A_1B_1 posttest essays. Although the difference of 14.09 words between the posttest means for the two groups may seem too small to be significant at the .009 level, it must be remembered that the pretest scores were used as covariates in this analysis and that the posttest means for the "analytic-conventional" classes represent a net loss from the pretest of 19.80 words (see Table 4.6)

Table 4.16 reports other analyses of covariance, these for the A_2B_2 essay data. As Table 4.16 indicates, neither course

had a significantly greater effect than the other on the mean
number of words per T-unit, the mean number of words per clause,
and the holistic score. Along the other three dimensions, how-
ever, significant course effects were found. Table 4.6 and
Table 4.13 show statistically significant positive change scores
along three dimensions--mean essay length, ratio of T-units with
final free modifiers to total T-units, and ratio of words in
final free modifiers to total words--for the "synthetic-tutorial"
students but not for the "analytic-conventional" students.
Thus it would appear that because of the instruction they received,
students in the "synthetic-tutorial" classes generated more
content for the A_2B_2 essays than did their counterparts in the
"analytic-conventional" classes. Furthermore, as the analyses
focusing on the use of final free modifiers indicate, the
"synthetic-tutorial" students were writing a larger proportion
of the syntactic structures shown to be related to writing
quality (see Nold and Freedman, 1977; Faigley , 1979c) than
were the students in the "analytic-conventional" classes.

Table 4.17 shows that neither course was more effective
than the other in producing significant change scores along the
several dimensions of the objective measures of writing-related
behaviors.

The analyses we have presented in connection with Derivative
Comparison 2 suggest that the "synthetic-tutorial"   classes
provided an attractive alternative for the "analytic-conventional"
classes. However, it cannot be determined from these analyses
whether the strength of the alternative lies in the difference

in curriculum--the "synthetic," Christensen-based curriculum--
or the instructional methodology--either tutorial or tutorial
with computer-assisted instruction. In an attempt to explore
this question, we devised Derivative Comparison 3, to which we
now turn our attention.

Derivative Comparison 3: All "Conventional" Classes
Compared with All "Tutorial" Classes. This comparison, like
the previous two derivative comparisons, involves no control
over the teacher variable. In some respects, the present compari-
son resembles Principal Comparison 4 (see Table 2.1), which
was designed to test for the effects of method of instruction
on writing performance in the "analytic" curriculum. Unlike
Principal Comparison 4, which rigorously controls for the teacher
variable and the curriculum variable, the present comparison
controls for neither. On either side of the present comparison
are included classes representing both curricula. Perhaps the
major weakness in the design of the present comparison is that
it ignores all curriculum X instruction interactions, thus
rendering the findings tentative and inconclusive from the
outset.

As with all other comparisons--derivative or principal--
reported in the present study, the data subsets used in the
present comparison derive from the data set reported in Table
4.1 and Table 4.5 for the 180 students selected from the 20
E 306 sections. For this comparison, the data for all students
enrolled in classes taught in conventional lecture-discussion
classes (N = 108) were pooled to form one data subset, and the
data for all students enrolled in tutorial classes (N = 72)

were pooled to form the other data subset.

Table 4.18 and Table 4.19 present the descriptive data
for the pretest and posttest dimensions of the two sets of
essays for both the "conventional" and the "tutorial" students
involved in the present comparison. These two tables also
report the results of paired T-tests of the changes across one
semester for both groups. Table 4.18 reveals that for the two

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Insert Table 4.18 about here.

Insert Table 4.19 about here.

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sets of essays, the "conventional" group showed statistically
significant change along three of the twelve dimensions--A_2B_2
essay length, and mean holistic score for both sets of essays.
For the "tutorial" group, in contrast, Table 4.19 shows statis-
tically significant positive change along four dimensions, all
associated with the A_2B_2 essays. Not only did the "tutorial"
group fail to improve their A_1B_1 essays significantly during
one semester, but the registered change was only one-fourth
of a point on a seven-point scale, about half the change realized
by the entire group of 180 students (see Table 4.1) and well
less than half the change realized by the "conventional" stu-
dents. The "tutorial" group realized significant gains during
the semester for this set of essays along the dimensions of

essay length, ratio of T-units with final free modifiers to total T-units, ratio of words in final free modifiers to total words, and holistic score. The gain in mean essay length of 53.74 words (the equivalent of over three T-units or of over five clauses) is nearly 15 words greater than the change recorded for all 180 students (see Table 4.1) and about 25 words larger than the change for the "conventional" students used in the present comparison. A large gain was also observed for the two syntactic indices focusing on final free modifiers. When the ratios for free modifiers are converted to percentages, we see that the "tutorial" students increased their mean percentage of T-units with final free modifiers by two tenths of one percent, while the "conventional" students increased theirs by only two one-hundredths of one percent. All 180 students increased their percentage by only nine one-hundredths of one percent (see Table 4.1), an increase which failed to reach significance at the .05 level of confidence. Given the previous finding, a comparable impressive change was recorded for the "tutorial" group along the dimension of percentage of words in final free modifiers. The holistic scores on the A_2B_2 essays for the "tutorial" students also changed significantly. The mean charge along this dimension was 0.83, which is 0.19 points greater than the gain realized by the "conventional" students and 0.11 points greater than that achieved by all 180 E 306 students.

These data seem to suggest the efficacy of "tutorial" instruction in teaching written discourse of the kind represented by the A_2B_2 essays when the curriculum and teacher variables are

left uncontrolled. However, when these data were tested for the effect of the instructional method on the change scores, no significant effects were found, as Table 4.20 and Table 4.21

Insert Table 4.20 about here.

Insert Table 4.21 about here.

indicate. With the .05 level of confidence as the criterion level, we note that the effect of the "tutorial" on the production of final free modifiers approached statistical significance at the .085 and the .059 level respectively. When the pretest essays were entered into the analysis as covariates, the lower pretest scores of the "tutorial" students, together with a possible greater variance within the pretest "tutorial" scores, cancelled out the instructional effect.

As some of the gains associated with the two sets of essays were significant for both the "conventional" and the "tutorial" courses, so were some of the gains on the objective tests. As

Insert Table 4.22 about here.

Insert Table 4.23 about here.

Table 4.22 and Table 4.23 illustrate, both the "conventional"
and the "tutorial" students achieved significant gains on
three of the four dimensions of the McGraw-Hill Writing Test.
Both groups, failed to achieve significant change scores on the
paragraph patterns section of the Writing Test, but both realized
statistically significant gains on the sentence patterns section.
On the McGraw-Hill Reading Test, the "conventional" group's
gain reached statistical significance beyond the .02 level of
confidence, while the "tutorial" group's gain failed to reach
significance. This latter finding is consistent with those
reported earlier for Derivative Comparison 2. In that earlier
comparison, the reading comprehension gain score failed to reach
significance for the "synthetic-tutorial" students (see Table
4.14), while it did reach significance for the "analytic-con-
ventional" students (see Table 4.10). That the "conventional"
classes in both the present comparison and in Derivative Compari-
son 2 achieved significant gains in reading comprehension and
that the "tutorial" classes in neither comparison achieved
significant gains suggests that "tutorial" instruction in
writing does not enhance reading comprehension to any remarkable
degree.

However, when we tested the data for the effect of instruc-
tional methodology on reading comprehension, we found that
neither method was clearly more effective than the other in
this regard. As Table 4.24 illustrates, the effect of instruc-
tional method was found to be insignificant when the pretest
scores of both groups were used as covariates in analyses of

Insert __Table 4.24__ about here.

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covariance. __Table 4.24__ also indicates that neither "conventional"
instruction nor "tutorial" instruction is more effective than
the other in producing gains along the dimensions of the __McGraw-
Hill Writing Test__. That is to say, neither appears more effec-
tive than the other when the classes representing the two
curricula in the present stuͷy are unevenly, and almost hap-
hazardly, distributed within the two sides of the comparison.
However, given the results of the previous two derivative com-
parisons the apparent equality between the "conventional" and
the "tutorial" methods is partly attributable to the contribu-
tions of the "tutorial" classes employing the "synthetic" cur-
riculum and partly attributable to the contributions of classes
using the "analytic" curriculum.

__Derivative Comparison 4: All "Analytic" Classes Compared
with All "Synthetic" Classes__. Whereas the previous comparison
attempted to test for the effects of instructional method on
the performances of E 306 students, the present comparison
attempts to test for the effects of the two curricula, the
"analytic" and the "synthetic." As in Derivative Comparison 3,
two important variables in this comparison were left uncontrolled.
With the previous comparison, we attempted to test for the
effects of instructional methodology, letting the teacher vari-
able and the curriculum variable go uncontrolled. With the

present comparison, we attempt to test for the effects of
curriculum, letting the teacher variable and the instructional
variable go uncontrolled. In some respects the present compari-
son resembles Principal Comparison 2 and Principal Comparison 5,
both of which test for the effects of curricula. However, as
Table 2.1 indicates, both principal comparisons control rigor-
ously for both the instructional variable and the teacher
variable. Thus in important ways the present comparison may be
seen as a prolegomenon to those two principal comparisons. We
believed that by removing the controls on the instructional and
teacher variables, the resultant larger N would produce a statis-
tically more powerful indication of the relative effectiveness
of the two curricula. As in all the derivative comparisons,
the data subsets used in the present comparison derived from
the data base established for all 180 selected students enrolled in
the 20 E 306 classes studied (see Table 4.1 and Table 4.5).

The pretest and posttest data and the results of the paired
T-tests of change scores for all "analytic" sections and all
"synthetic" sections appear in Table 4.25 and Table 4.26 for the
two sets of essays written by both groups of students.

Insert Table 4.25 about here.

Insert Table 4.26 about here.

Table 4.25 reveals that the students enrolled in the "analytic" curriculum achieved significant positive changes only along the dimensions of holistic scores for both sets of essays. This is an important finding, given the principal goals of E 306. The writing of the students, regardless of the instructional methodology, enrolled in the "analytic" curriculum improved over the course of one semester of writing instruction. These change scores for the "analytic" students far exceeded the criterion level of significance at the .05 level. In the case of the A_1B_1 essays, the change was significant beyond the .007 level; and in the case of the A_2B_2 essays, the change was significant beyond the .001 level. These gains by the "analytic" students are nearly identical to those realized by the entire group of 180 E 306 students (see Table 4.1).

Other interesting facts about the performances of the "analytic" students also appear in Table 4.25. For example, the changes recorded for essay length are nearly identical, 18.50 words for the A_1B_1 essays and 18.29 words for the A_2B_2 essays. However, only the change for the A_2B_2 was a positive one: the posttest essays on the A_1B_1 topics were shorter than the pretest essays. Negative change scores were also found along all the syntactic dimensions for the A_2B_2 essays, while positive changes were found along all of these dimensions for the A_1B_1 essays. None of these syntactic changes for either essay set was found to be statistically significant. Thus these findings would seem to suggest that the highly significant positive changes along the dimensions of the two holistic scores

are not tied very closely to any of the syntactic features we
measured for the "analytic" students.

An examination of Table 4.26, which focuses on the changes
recorded for the "synthetic" group, reveals some striking differ-
ences between the two groups of students involved in the present
comparison, as well as some interesting similarities. For
example, the "analytic" students did not significantly increase
the lengths of their essays on either set of topics, but the
"synthetic" students increased theirs on both beyond the .001
level of confidence. This finding may suggest that the "synthetic"
curriculum teaches students to generate more content for a
given subject matter than does the "analytic." That is to say,
the "synthetic" curriculum may better teach invention skills
than does the "analytic" curriculum. A comparison of Table 4.25
and Table 4.26 also reveals that neither group showed any signi-
ficant change along the dimensions of T-unit or clause length
for either set of essays. However, the changes recorded for
the two groups along these dimensions were in opposite direc-
tions for the two sets of essays. In addition, neither group
achieved significant positive change on the A_1B_1 essays along
the dimensions associated with final non-restrictive modifiers;
but on the A_2B_2 essays the "synthetic" students did achieve
highly significant gains (beyond the .001 level of confidence
for both indices) along both dimensions. The most important
difference between the performances of the two groups lies in
the changes in the holistic scores for the two essay sets.
Table 4.25 reveals that the "analytic" students realized highly

significant gains along this dimension for both sets of essays.
Table 4.26 shows that the gains on the A_1B_1 essays for the
"synthetic" students failed to reach statistical significance
at the .05 level of confidence. This change, however, actually
did approach that level of confidence and did, in fact, exceed
by 0.05 of a point the highly significant change reported in
Table 4.1 for all 180 E 306 students. The gains for the
"synthetic" students on the A_2B_2 essays, while significant
beyond the .03 level of confidence (a level falling consider-
ably short of the .001 level recorded for the "analytic" students),
actually exceeded the 0.72 of a point gain recorded in Table
4.1 for all students and the 0.70 of a point gain reported for
the "analytic" students in the present comparison. This apparent
discrepancy is actually no discrepancy at all because with an
N of 54 (as in the present "synthetic" classes), it is more
difficult to compute statistically higher levels of probability
than it is with an N of 126 (as in the present "analytic" sections).

Given the respective sample sizes, both groups appear to
have fared well along the dimensions that probably matter the
most, the holistic scores assigned to the respective essay sets.
Indeed, when we performed the analyses of covariance (using
the pretest scores as covariates) to test for the effects of
the curricula, we found that neither curriculum was more effec-
tive than the other in producing positive changes along the
dimensions of the holistic scores. This conclusion is drawn
from the analyses summarized in Table 4.27 and Table 4.28.
However, given the gain scores reported in Table 4.25 and Table

.4.26 and given our discussions of those gain scores, it is

Insert Table 4.27 about here.

Insert Table 4.28 about here.

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perhaps better to say that the "analytic" and the "synthetic"
curricula are equally effective in producing positive change
in writing quality for both types of essays represented by the
two essay sets. Other important findings are also indicated
by Table 4.27 and Table 4.28. Given the respective changes
reported in Table 4.25 and Table 4.26 for essay length on both
sets of essays for both groups of students, the conclusion that
the "synthetic" curriculum effected the writing of longer essays
while the "analytic" curriculum did not is inescapable. This
finding may represent evidence that invention is much better
taught in the "synthetic" classes than it is in the "analytic"
classes. Although we will have much more to say in a subse-
quent chapter on the relationship between essay length and
writing quality, we will note for the present that Nold and
Freedman (1977) found that an essay feature called "short"
correlated highly with essay quality and that essay length is
a reliable predictor of essay quality, a conclusion which is
supported by our discussion in Chapter 3 of cohesive ties in
E 306 papers rated high or low in quality. The present analyses

of variance also point to other important course effects.
Given the data and the analyses presented in Table 4.25 and
Table 4.26, Table 4.27 and Table 4.28 indicate that while
neither the "analytic" nor the "synthetic" curriculum was more
effective than the other in promoting changes in mean T-unit
and clause length (although the effect of the "analytic"
curriculum approached significance), the "synthetic" curriculum
seemed to effect highly significant changes in the A_2B_2 essays
along the dimensions associated with final free modifiers.
As we have repeatedly pointed out, final non-restrictive modi-
fiers have been shown to be important predictors of writing
quality (see again Nold and Freedman, 1977; and Faigley, 1979c).
However, neither curriculum appeared to have effected comparable
changes in the A_1B_1 essays.

Changes for both the "analytic" and the "synthetic" groups
were also observed along the dimensions of objective tests of
writing-related behaviors. These changes are reported in Table
4.29 and Table 4.30. As these tables illustrate, both groups

Insert Table 4.29 about here.

Insert Table 4.30 about here.

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achieved highly significant changes (beyond the .001 level of
confidence) on both the language mechanics section and the total

score of the McGraw-Hill Writing Test. These tables also show
that neither group realized significant changes on the paragraph
patterns subtest or on the Daly-Miller Writing Apprehension
Test. As should be expected, given the attention to sentence-
level operations in the "synthetic" curriculum, the "synthetic"
students realized significant positive change beyond the .001
level of confidence on the sentence patterns section of the
Writing Test while the "analytic" students did not. Also as
should be expected given the emphasis on reading in the "analytic"
curriculum, the "analytic" students achieved gains in reading
comprehension which were significant at the .017 level of con-
fidence, whereas the reading scores for the "synthetic" students
did not change significantly.

To determine whether a course effect was present in these
change scores for the two groups, we again conducted analyses
of variance. Again we used the pretest scores for both groups
as covariates in the anlayses. The results of these analyses
are reported in Table 4.31. As Table 4.31 shows, no significant

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Insert Table 4.31 about here.

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course effects were found for any of the changes, although those
reported for the sentence patterns subtest of the McGraw-Hill
Writing Test approached signifance at the .08 level of confi-
dence. Given the data and the analyses represented in Table
4.29 and Table 4.30, these findings suggested that course effect

is attributable to the "synthetic" curriculum. The previously
reported significant gains for the "analytic" group on the
reading comprehension section of the McGraw-Hill Reading Test
proved not to be enough larger than those of the "synthetic"
students to render higher levels of reading comprehensio.. a
function of the "analytic" curriculum.

The data and the analyses we have presented in connection
with Derivative Comparison 4 strongly suggest that when the
instructional and teacher variables are .iot controlled, both
the "analytic" and the "synthetic" E 306 curricula yield some
important and impressive effects on the writing and writing-
related perfor.. nces of the students they serve.

Derivative Comparison 5: All "Analytic-Conventional"
Classes Compared with All "Analytic-Tutorial" Classes. This
comparison resembles in some ways Derivative Comparison 1 (see
Table 2.2). The earlier comparison tested for the effect of
curriculum on conventional classroom instruction when the
teacher variable was left uncontrolled. The present comparison,
in contrast, tests for the effects of the instructional variable
within the "analytic" curriculum without controlling for the
teacher variable. With two exceptions, the present comparison
is identical to Principal Comparison 4 (see Table 2.1); the
two differ in that the present comparison does not control for
the teacher variable and uses, as a consequence, a larger number
of cases on either side of the comparison. As in the previous
derivative comparisons, the data subsets here are drawn from

the data base reported in Table 4.1 and Table 4.5. In the
present comparison, all "analytic-tutorial" sections are pooled
in order to form a data subset with 36 cases on one side of
the comparison. The data subset for the other side of the
comparison consists of the data for all 90 E 306 students
who were enrolled in "analytic-conventional" classes. This
latter data subset is the same one used previously in Derivative
Comparison 1 and Derivative Comparison 2.

Because we have already examined the change scores (see
Table 4.6 and Table 4.10) of the "analytic-conventional" students
and discussed the significance of those scores, we can focus
immediately on the changes achieved by the analytic-tut-rial"
students. These changes for the two essay sets are recorded
in Table 4.32. As Table 4.32 shows, only the gain on the

Insert Table 4.32 about here.

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holistic scores assigned the A_2B_2 essays reached statistical
significance. But that gain, while only significant at the
.027 level of confidence, exceeds the gain reported for all
180 students involved in the present study (see Table 4.1) by
0.14 of a point; and it exceeds the gain of the "analytic-
conventional" students by 0.23 of a point. The holistic scores
assigned the A_1B_1 essays, however, are a totally different
matter: the change across the semester is almost imperceptible.
This latter very small positive change may be partially explained
with reference to the unusually high pretest scores on the

A_1B_1 essays, the average of which was 0.56 of a point higher than that for the group of E 306 students as a whole (see Table 4.1).

Some other interesting facts appear in Table 4.32. For example, the A_1B_1 posttest essays were shorter than their pretest counterparts, and the A_2B_2 posttest essays were longer (to a degree approaching statistical significance) than their pretest counterparts. Just the reverse occurred for mean T-unit and mean clause length: whereas the posttest means for both indices were longer for the A_1B_1 essays, they were shorter for the A_2B_2 essays. This finding is altogether compatible with the findings reported for all 180 E 306 students: the entire population gained along these dimensions on the A_1B_1 essays but regressed along them on the A_2B_2 essays. However, the total E 306 population we studied realized gains along the other two syntactic indices on both sets of essays, whereas the "analytic-tutorial" students regressed along those dimensions on the A_1B_1 essays and failed to gain at significant levels on the A_2B_2 essays. Noticeable differences also appear between the "analytic-tutorial" students and the "analytic-conventional" students. Since the means and the changes for the "analytic-conventional" sections were treated previously, we simply refer the reader to Table 4.6 and to the earlier discussions.

To answer the question of the effect of instructional type on student performance in the "analytic-conventional" and the "analytic-tutorial" sections in the present comparison, we again conducted analyses of covariance on the two sets of essay data,

allowing the pretest scores for each dimension to function as covariates in the analyses. The results of these analyses are reported in Table 4.33 and Table 4.34. Both tables indicate

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Insert Table 4.33 about here.

Insert Table 4.34 about here.

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that when the curriculum variable is controlled, one instructional method--whether "conventional" classroom instruction or "t.orial" instruction--seems to have no greater effect on student writing performance than the other. We will have occasion to refer back to this finding in connection with our discussion of Principal Comparison 4, which involves the same comparison but with the teacher variable controlled.

Our analyses of the change scores along the dimensions of the objective tests are not much more revealing at this point. The change scores and the tests of their significance for the "analytic-conventional" sections were reported in Table 4.10 and discussed earlier. The comparable data for the "analytic-tutorial" sections are presented in Table 4.35. This table indicates that the "analytic-tutorial" students realized

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Insert Table 4.35 about here.

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significant gains along the same dimensions of the McGraw-Hill
Writing Test as did the "analytic-conventional" students (see
Table 4.10). However, whereas the mean change along the
dimension of reading comprehension was significant beyond the
.004 level of confidence for the "analytic-conventional" students,
the average change for the "analytic-tutorial" students was
not at all significant, except in terms of the mean change
being very close to zero. As Table 4.10 and Table 4.35 reveal,
neither group changed significantly along the dimension of the
Daly-Miller Writing Apprehension Test.

As with the previous comparisons, we employed analyses of
covariance to determine whether the change scores recorded
for the objective tests were the effects of the dependent
variable, in this case the instructional method. The results
of the analyses are reported in Table 4.36. As Table 4.36

Insert Table 4.36 about here.

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reveals, neither instructional method had a significant effect
on the performance of the students examined in the present
comparison. However, the differences between the two groups
of students did approach statistical significance along two
dimensions. With the pretest scores entered as covariates into
the analyses of covariance, the difference between the posttest
scores suggests that the "analytic-tutorial" courses may have
had more of an effect on performance on the language mechanics
section than did the "analytic-conventional" courses. The

reverse is suggested for performances on the reading compre-
hension section of the Reading Test. The difference along
that dimension, however, approaches statistical significance
only at the .069 level of confidence.

4.3   Chapter 4:   A Summary

The preceding five derivative comparisons and the analyses
of the performances of all 180 E 306 writers we studied yielded
a number of important findings. Paramount among these findings
are, of course, those which serve as evidence of the overall
effectiveness of E 306.

As we have noted, the overall quality of the narrative-
descriptive essays, which were designed to draw on personal
experience, improved significantly beyond the .001 level of
confidence for the 180-student population we studied. Similarly,
the overall quality of the argumentative essays, which adopt
a position on an issue and then defend that position, increased
substantially across the semester for the entire group of 180
students. Thi latter gain, which was a good deal larger than
the gain registered for the narrative-descriptive essays, was
also significant beyond the .001 level of confidence. Our
examination of the essay data for all 180 E 306 students also
indicates that the students as a group achieved positive gains
for two features of the argumentative essays as well. These
gains were observed for essay length and mean percentage of
words in final free modifiers, two dimensions which previous

research has shown to be associated positively with essay quality.
Of the one length feature and the four syntactic features we
examined on the narrative-descriptive essays, none showed
statistically significant change.

We also examined the change scores of all 180 E 306
students for the three subtests of the McGraw-Hill Writing Test,
the paragraph comprehension subtest of the McGraw-Hill
Reading Test, and the Daly-Miller Writing Apprehension Test.
Neither the entire population of 180 students nor any of the
various subpopulations we examined registered significant
changes on the Writing Apprehension Test, suggesting that neither
E 306 nor any instructional or curricular component affects
writing apprehension significantly, either by reducing it or
by increasing it. For the McGraw-Hill tests, the results were
quite different, and much more encouraging, showing that the
improvement in writing quality was accompanied by higher scores
on objective measures of writing-related skills. The group of
180 students we examined realized gains which were significant
beyond the .001 level of confidence on three of the four dimen-
sions of the Writing Test. These dimensions are the language
mechanics and the sentence patterns subtests and the total score.
Only the changes on the paragraph patterns subtest failed to
reach statistical significance at the .05 level of confidence;
in fact, the changes along this dimension for the entire 180-
student population were in a negative direction. This latter
finding, however, may reflect more on the test instrument than
the student performances. The entire 180-student group also

realized significant gains in reading comprehension. Although
those gains did not reach the level of statistical significance
observed for the gains on the three dimensions of the Writing
Test, they did reach significance beyond the .03 level of
confidence. This finding strongly suggests that E 306 not only
teaches students to write better but it also teaches them to
read better.

Analyses conducted in connection with the five derivative
comparisons also yielded some important results. From these
analyses, we can conclude that both the "synthetic" and the
"analytic" curricula are effective, but in somewhat different
ways. The "synthetic" curriculum seems to be more effective
in terms of producing longer posttest essays on the argumentative
writing topics and in terms of encouraging a greater use of
final free modifiers in essays which argue for or against a
position on a controversial issue. The "synthetic" curriculum,
however, generally appears not to effect increases in the use
of final free modifiers on the narrative-descriptive essays,
but it does seem to promote longer essays there too. The
changes in essay length caused by the "synthetic" curriculum
may indicate that that curriculum better teaches invention
skills than does the "analytic" curriculum. Neither curriculum
appears to be more effective than the other in increasing essay
quality, but both appear to promote highly significant positive
changes in quality for essays written on both sets of writing
topics. This finding is somewhat surprising in light of the
fact that the "synthetic" curriculum required its students to

write five or six fewer whole essays than did the "analytic"
curriculum. It is also somewhat surprising in light of the
fact that the "synthetic" curriculum did not specifically
teach students to write essays which draw on personal experi-
ence, while some attention was paid to expressive discourse
in the "analytic" curriculum.

The analyses conducted for the derivative comparisons
also suggest some important differences between the two curri-
cula along the dimensions of the objective measures of writing-
related skills. Although both curricula appear to promote
higher, and statistically significant, posttest scores on the
language mechanics subtest and the total score of the McGraw-
Hill Writing Test, the "synthetic" curriculum appears to pro-
duce positive change on the sentence patterns subtest, whereas
the "analytic" curriculum does not. Although the gain scores on
reading comprehension subtest of the McGraw-Hill Reading Test
for the students in the "synthetic" curriculum were not found
to be statistically significant whereas those for the students
in the "analytic" curriculum were, analyses of covariance
indicated that these differences cannot be attributed to the
effect of the "analytic" curriculum.

As regards instructional methods, our analyses are very
inconclusive, indicating that both "conventional classroom"
instruction and "tutorial" instruction are effective when the
curriculum variable is not controlled. When the curriculum
variable was controlled, we found no significant effects for
the instructional variable on the posttest data for the two

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essay sets. Our analyses of the posttest data for the objec-
tive measures yielded some evidence, although very weak evidence,
suggesting that the "tutorial" method improved performance on
the language mechanics subtest and that the "conventional"
method enhances growth in reading comprehension. While there
is very little evidence to indicate that either method better
effects changes in writing performance or on scores for objec-
tive tests of writing-related skills, the generally higher
attrition rate in tutorial classes (see Chapter 1), the fre-
quently higher costs per credit hour, and the larger demands
on the teacher's time all suggest that the "tutorial" method
of instruction is not an efficient alternative to "conventional"
classroom instruction in writing.

CHAPTER 5

THE FIVE PRINCIPAL COMPARISONS

In the preceeding chapter we offered five comparisons which drew in various ways on the complete data set for the 180 students selected for the present study. Those comparisons were not called for in the original research design but seemed to us capable of identifying some of the effects of the two curricula--the "synthetic" and the "analytic"--and some of the effects of the two basic instructional methods--"conventional" classroom instruction and "tutorial" instruction--used in E 306. What those five derivative comparisons showed was that both curricula and both instructional methods are effective, but in somewhat different ways. The five principal comparisons offered in the present chapter will, through the control over the teacher variable, add a degree of specificity not possible in the five derivative comparisons. However, what is gained in specificity is frequently lost in statistical power in the following principal comparisons.

5.1 Review of The Five Principal Comparisons

The five principal comparisons which the present study was initially designed to explore were delineated in Chapter 2. They

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will be reviewed briefly here.

Principal Comparison 1 is the major comparison. In this comparison, the "analytic" curriculum taught in a conventional classroom setting forms one side of this comparison and the "synthetic" curriculum taught in a "tutorial" setting with the use of computer-assisted instruction forms the other side. These two sides of Principal Comparison 1 represent the two major E 306 options as they were taught during the Fall Semester, 1978. In this comparison both the curriculum and the instruction variables differ across the comparison.

Principal Comparison 2 and Principal Comparison 5 were designed to test for the effects of the two curricula when the instruction variable is controlled. In Principal Comparison 2, the two curricula are compared when the instructional method for both is "conventional" classroom instruction. In Principal Comparison 5, the two curricula are also compared; but in this case, the instructional method used to teach both curricula is "tutorial" instruction, without computer-assisted instruction.

The effects of instructional type is the primary concern of Principal Comparison 4. That comparison was designed to test for the effects of "conventional" classroom instructional and for "tutorial" instruction in teaching the "analytic" curriculum. Ideally, we should have had a similar comparison wherein the effects of the instructional variables could have been tested for the "synthetic" curriculum. Such was not, however, possible because not enough "synthetic" curriculum classes were offered during the Fall Semester of 1978 to accommodate additional comparisons.

Finally, Principal Comparison 3 was designed to test for the effects of the two rhetoric texts, the Rodi syllabus and The Writing Commitment, on learning in "analytic" curriculum classes taught by the "conventional" classroom method of instruction.

With the exception of Principal Comparison 3, it was believed that each of the five principal comparisons would shed some light on the effect of the instructional and curricular variables which, for obvious reasons, could not be controlled in Principal Comparison 1. Each of these comparisons is set out in some detail in Chapter 2 and Table 2.1. Chapter 2 also explains how the teacher variable was controlled for each of these comparisons; and it explains how the data were collected and the sample population selected. As the results of these five comparisons are reported, we shall try to place those results in the context of the performances of the entire group of 180 E 306 students we studied and in the context of the results of the previously reported derivative comparisons. In reporting our analyses and results for the five principal comparisons, we will generally follow the same procedures used in reporting the derivative comparisons.

5.2 The Results of the Five Principal Comparisons

Principal Comparison 1: "Analytic-Conventional" Students (N=18) Compared with "Synthetic-Laboratory/Tutorial" Students (N=18). This comparison is the major comparison of the present study, because it pairs the two major E 306 options as they were taught during the Fall Semester of 1978. It is this comparison which all other

comparisons, principal or derivative, were designed to illuminate.
In this comparison, as in all principal comparisons, the teacher
variable was rigorously controlled. Of the four classes involved
in this comparison, all were taught by just two instructors, with
each instructor teaching one class on either side of the comparison.
Unlike the remaining principal comparisons, the curricular and
instructional variables are not rigorously controlled. In this
comparison, two curricula and two instructional methods are com-
pared, the "analytic" curriculum taught in a "conventional" class-
room setting compared with the "synthetic" curriculum" taught in
a tutorial" setting with the aid of computer-assisted instruction.

Table 5.1 and Table 5.2 present the pre- and posttest de-
scriptive data for the two sets of essays for the "analytic-
conventional" and the "synthetic - laboratory/tutorial" classes
involved in the present comparison. These two tables also report

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Insert Table 5.1 about here.

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the results of paired T-tests of the changes across the semester
for both groups.

Table 5.1 shows that for the "analytic-conventional" classes,
none of the change scores reached significance at the .05 level of
confidence, although the gain in mean holistic score for the A_1B_1
essays approached significance at the .069 level. With regard to
the A_1B_1 essays, Table 5.1 shows that the "analytic-conventional"
students realized negative changes along two of the six dimensions,

essay length and clause length. The small loss in mean clause length is not surprising since the "analytic-conventional" students underwent no instruction designed specifically to lengthen clauses. The net average loss of 64.06 words in essay length--an average net loss greater by 44.26 words than that recorded for all "analytic-conventional" students (see Table 4.6)--is important, since the 180 students in all 20 E 306 sections gained, albeit only slightly, as a group along this dimension. The two ratios calculated for the use of final nonrestrictive modifiers in the A_1B_1 are another matter. For these "analytic-conventional" students, the two ratios were considerably larger than those observed for all "analytic-conventional" students (see Table 4.6) and for all 180 students (see Table 4.1). Although the mean holistic score on the A_1B_1 posttest essays of the 18 "analytic-conventional" students represented in Table 5.1 was not significantly higher than that of the pretest essays, the difference between the two was actually quite large. In fact, that average gain of one full point on a seven-point scale is 0.51 of a point larger than the average gain recorded for all 180 students (see Table 4.1) and 0.34 of a point higher than the average gain for all 90 "analytic-conventional" students (see Table 4.6).

The change scores for the A_2B_2 essays are also worth noting. On the A_2B_2 essays there was an average net gain of 22.17 words from the pretest essays to the posttest essays, a gain about ten words larger than that observed for all 90 "analytic-conventional" students (see Table 4.6) and a gain about 17 words smaller than that recorded for all 180 students (see Table 4.1). The average T-unit and clause lengths on the A_2B_2 for these 18 "analytic-

conventional" students showed a substantial, although not a statistically significant, increase during the semester. This finding was a little unexpected since the average change for all 90 "analytic-conventional" and for all 180 students along both dimensions was negative (see Table 4.6 and Table 4.1). The mean change scores for the present "analytic-conventional" students along the two dimensions associated with final free modifiers were negative. While the mean change scores for all "analytic-conventional" students (see Table 4.6) along these dimensions were negative, small average group gains were found for all 180 students (see Table 4.1). As was the case for the A_1B_1 essays, the average holistic score on the A_2B_2 essays of the present group of 18 "analytic-conventional" students increased by a full point. This average gain is 0.28 of a point higher than it was for all 180 students (see Table 4.1) and 0.37 of a point higher than for all 90 "analytic-conventional" students (see Table 4.6) used in three derivative comparisons.

Reference to Table 5.2 allows us to compare the average gains of the "analytic-conventional" students represented in Table 5.1 to those of the "synthetic-laboratory/tutorial" students. As Table 5.2 indicates, these 18 "synthetic" students realized statistically significant average gains along two of the twelve dimensions associated with the two essay sets. None of the averages changes for the A_1B_1 essays was significant statistically. Nevertheless, whereas the "analytic-conventional" students in the present comparison had an average net loss of over 64 words in essay length for the A_1B_1 essays, the present "synthetic" students gained on

the average 35.5 words, a difference in average change between the two groups of nearly 100 words. Both of the two groups in the present comparison realized similar positive changes in mean T-unit length, and both realized negative changes in mean clause length. The results of these changes are comparable posttest means for the two groups. Whereas the "analytic" students represented in Table 5.1 showed a small average gain for the two ratios for final nonrestrictive modifiers in the A_1B_1 essays, the present group of "synthetic" students recorded an average net loss. Although this average negative change is consistent with the mean negative change for all "synthetic-tutorial" students (see Table 4.13), the average net loss for the present "synthetic" students is greater. For the holistic scores on the A_1B_1 essays of the present group of "synthetic" students, the average change was 0.06 of a point. This mean change is 0.94 of a point smaller than the average gain recorded for the "analytic-conventional" students in the present comparison, 0.43 of a point smaller than the average gain recorded for all 180 students (see Table 4.1), and 0.41 of a point smaller than that of all "synthetic-tutorial" students (See Table 4.13). This latter figure may thus indicate that computer-assisted instruction had an adverse effect on the A_1B_1 posttest essays of the "synthetic-laboratory/tutorial" students.

The "synthetic-laboratory/tutorial" students fared much better on some of the dimensions associated with the A_2B_2 essays. One of these dimensions was not, however, essay length, for which a mean loss of slightly more than two words was recorded. This average difference in length between the A_2B_2 pre- and posttest essays was not only in a negative direction, but it was also over 74 words

smaller than that recorded for all "synthetic-tutorial" students

(see Table 4.13). It would thus appear that computer-assisted

instruction of the type used in the "laboratory" sections had a

negative effect on A_2B_2 posttest essay length as well as on A_1B_1

posttest essay quality.

Although these negative effects may be present, there also

seem to be some equally impressive positive effects of, apparently,

the "computer-assisted" component. Ignoring the insignificant

changes in T-unit and clause length on the A_2B_2 essays, we see

that positive change was effected along the dimensions of the two

ratios associated with final free modifiers and holistic score.

First, the two ratios. Converted to percentages, the gains repre-

sented by the two ratios--both significant beyond the .002 level

of confidence--are quite impressive. The mean percentage of T-

units with final nonrestrictive modifiers for the "synthetic-

laboratory/tutorial" students rose from 2.9% on the A_2B_2 pretest

essays to 7.5% on the posttest essays. This 4.6% average increase

is larger by nearly a full percentage point than the average in-

crease for all "synthetic-tutorial" students (see Table 4.13),

three and one-half percentage points larger than the average change

for all 180 students (see Table 4.1), and three and six-tenths per-

centage points larger than the average increase for all "analytic-

conventional" students (see Table 4.6) and for the "analytic-

conventional" students involved in the present comparison. When

the ratio of words in final free modifiers is converted to percentages,

comparably impressive average gains are observed. Equally impres-

sive average gains were found along the dimension of the holistic

score, even though that mean change only approached statistical

significance at the .068 level of confidence. The "synthetic-laboratory/tutorial" students improved on the A_2B_2 posttest essays by an average of 1.11 points over the pretest essays. Although the average posttest score of 5.33 is 1.06 points less than the comparable score for the "analytic-conventional" students in the present comparison, the average gain is 0.39 of a point larger than the gain for all 180 students (see Table 4.1), 0.11 of a point larger than the average gain for the "analytic-conventional" students in the present comparison, and 0.31 of a point greater than the average gain for all "synthetic-tutorial" students (see Table 4.13).

To determine whether a course effect caused any of the changes identified in Table 5.1 and Table 5.2, we ran analyses of covariance on the posttest means for both sets of essays. As in the derivative comparisons, the appropriate pretest scores were entered into the analyses as covariates. These analyses for the A_1B_1 and the A_2B_2 essays are presented in Table 5.3 and Table 5.4. As Table 5.3

Insert Table 5.3 about here.

Insert Table 5.4 about here.

indicates, significant course effects were not found for average essay length, T-unit, or clause length on the A_1B_1 posttest essays. However, significant course effects were found for the two dimensions

associated with final nonrestrictive modifiers and for holistic
score. When the posttest means for the A_1B_1 essays for each course
are compared, it becomes obvious that the effects were caused by
the "analytic-conventional" course.

Table 5.4 presents the results of the analyses of covariance
for the A_2B_2 posttest essay means. As this table illustrates, no
significant effects were found for mean clause length, the two
ratios associated with final free modifiers, or holistic score.
For the latter of the two free modifier indices the F-ratio did,
however, approach statistical significance. Comparison of the
posttest means of the two groups of students indicates that this
high F-ratio favors the "synthetic-laboratory/tutorial" courses.
The statistically significant effects for mean essay length and
mean T-unit length, on the other hand, indicate that the longer
"analytic" posttest essays and T-units are attributable to instruc-
tion in the "analytic" classes.

Thus the analyses of covariance we performed on the twelve
posttest means for the two E 306 options for both sets of essays
suggest that the "analytic" option is the better of the two. No
statistically significant course effects for the "synthetic-laboratory/
tutorial" classes were found, but five were found for the "analytic-
conventional" classes, one of which was for A_1B_1 posttest essay quality.

Not only did the performances of the two student groups differ
with respect to actual writing, but two groups of the students also
differed with respect to their performances on the objective measures.
The pre- and posttest descriptive data for both groups, as well as
T-tests of the change scores, appear in Table 5.5 and Table 5.6. As
Table 5.5 indicates, only the pretest-to-posttest average change for

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Insert Table 5.5 about here.

Insert Table 5.6 about here.

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the language mechanics subtest of the McGraw-Hill Writing Test

reached statistical significance for the "analytic-conventional"

students. That average gain was 0.60 of a point less than that

recorded for all "analytic-conventional" students (see Table 4.10)

and 0.88 of a point smaller than the average gain recorded for all

180 E 306 students (see Table 4.5).

Table 5.6, which records the change score averages for the

"synthetic-laboratory/tutorial" classes, indicates that significant

improvement for that group occurred during the semester along three

of the four dimensions associated with the McGraw-Hill Writing Test.

Although statistically significant at a higher level than that re-

corded for the "analytic-conventional" classes, the average change

score for the "synthetic" classes on the language mechanics sub-

test was 0.39 of a point smaller. It is also 1.27 points smaller

than the mean gain recorded for all 180 students (see Table 4.5)

and 0.61 of a point smaller that the mean gain for all "synthetic-

tutorial" students (see Table 4.14). The average gain for the

sentence pattern subtest was also statistically significant for

the present "synthetic" classes. That mean gain was 0.34 of a

point longer than the one for all "synthetic-tutorial" students

(see Table 4.14), 1.69 points higher than that for the "analytic-

conventional" classes in the present comparison, and one point

higher than the mean gain for all 180 students (see Table 4.5).
While neither group in the present comparison realized significant
gains on the paragraph patterns subtest, the "synthetic" group
realized a significant average gain on the total score of the
Writing Test, not a surprising finding given the significant
gains on the language mechanics and the sentence patterns subtests.
This statistically significant mean gain was, however, slightly
smaller than the one recorded for all "synthetic-tutorial" stu-
dents (see Table 4.14), slightly larger than that observed for
all 180 students (see Table 4.5), and 1.08 points greater than
that of the "analytic-conventional" students in the present comparison.

Although neither group realized statistically significant gains
on the paragraph comprehension subtest of the McGraw-Hill Reading
Test, the average gain for the synthetic students was 0.81 of a
point higher than that of the "analytic" students, suggesting that
perhaps computer-assisted instruction positively affects reading
comprehension, a suggestion finding some support in analyses pre-
sented in connection with other principal comparisons. It should,
however, be noted that the mean gain score on the paragraph com-
prehension subtest for the present "analytic-conventional" students
is 0.65 of a point less than that recorded for all 180 students
(see Table 4.5) and 1.05 points less than that observed for all
"analytic-conventional" students (see Table 4.10). Neither group
in the present comparison registered statistically significant
changes on the Miller-Daly Writing Apprehension Test.

To determine whether any course effects were indicated for
any of these posttest means, we performed analyses of covariance,

using the appropriate pretest scores as covariates in the analyses. The results of these analyses appear in Table 5.7. As Table 5.7 indicates, none of the computed F-ratios was statistically significant beyond the .05 level of confidence. The "synthetic" posttest means for the sentence patterns subtest did, however, approach statistical significance at the .08 level of confidence, thus suggesting that the "synthetic" course may with a larger N prove to be effective in producing improvement along that dimension. However, generally speaking, neither the "analytic-conventional" nor the "synthetic-laboratory/tutorial" course appears more effective than the other in producing positive changes measured by these objective tests.

Given the preceeding analyses and presentations of the data for the two groups used in Principal Comparison 1, we must conclude that while the "synthetic-laboratory/tutorial" students performed at least as well as the "analytic-conventional" students on several measures and slightly outperformed them on three, the "analytic-conventional" sutdents clearly outperformed their counterparts along five dimensions, the most important of which was the quality scores assigned to the A_1B_1 essays.

Principal Comparison 2: "Analytic-Conventional" Students (N=18) Compared with "Synthetic-Conventional" Students (N=18). While Principal Comparison 1 allowed for rigorous control of the teacher variable, it did not allow for control of the curriculum and the instruction variables. To have imposed controls on all these variables would have eliminated from the present study the two major E 306 options as they were taught in the Fall of 1978. With the

analyses connected with Principal Comparison 1, we were able to determine that in general the "analytic-conventional" classes were more effective than the "synthetic-laboratory/tutorial" classes. However, because neither the curriculum nor the instruction variables could be controlled, the need for additional analyses should be obvious. With the present comparison, we provide additional analyses, focusing on the effects of the two curricula--the "analytic" and the "synthetic"--when both the teacher variable and the instructional variable are controlled. The four classes in the present comparison were taught by two teachers, each teaching one "analytic" class and one "synthetic" class. All four classes were taught in a "conventional" classroom setting. With the controls exerted on the instructional variable, the present comparison thus resembles Derivative Comparison 1; however, in the present comparison with its control over the teacher variable, the same number of cases appear on both sides of the comparison.

The pretest and the posttest essay data for the 18 "analytic-conventional" students and the 18 "synthetic-conventional" students appear in Table 5.8 and Table 5.9. These tables also report the results of paired T-tests of the change scores for the two groups of students.

Insert Table 5.8 about here.

Insert Table 5.9 about here.

Table 5.8 shows that none of the change scores associated with the two sets of essays was statistically significant at the .05 level of confidence for the "analytic-conventional" students. Of the twelve change scores recorded, half were negative and half were positive. For both sets of essays, the mean length of the pretest essays was longer than that of the posttest essays. The average net loss of $16.8^\wedge$ words for the A_1B_1 essays stands in contrast to a very slight average gain for all 180 E 306 students' (see Table 4.1), but the loss is approximately three words less than that recorded for all "analytic-conventional" students (see Table 4.6) and about 54 words larger than that for all 180 E 306 students (see Table 4.1). A similar set of circumstances attends the average net loss of 38 words on the A_2B_2 posttest essays for the present 18 "analytic-conventional" students. The posttest mean for the A_2B_2 essays is about 40 words larger than that for all "analytic-conventional" students (see Table 4.6) and about 17 words greater than that for all 180 E 306 students (see Table 4.1). The average net gain for the present "analytic" students is, however, 49 words smaller than the average gain for all "analytic conventional" students (see Table 4.6) and 77 words smaller than that of all 180 students (see Table 4).

The syntactic indices also provide the basis for some interesting comparisons. For both sets of essays, the mean T-unit length grew shorter while mean clause length grew longer. These change scores do not appear to be statistically different from those recorded for either all E 306 students (see Table 4.1) or all "analytic-conventional" students (see Table 4.6), even though the directions

of the changes among the groups vary considerably. For the two
ratios calculated for final nonrestrictive modifiers on both sets
of essays, the change scores were not significant. The changes
for the present "analytic" students along these dimensions on the
A_1B_1 essays were both negative, but they were positive for all
"analytic-conventional" students (see Table 4.6); however, the
positive changes for this latter group were very small ones. The
same holds true for the changes recorded for all 180 E 306 students
(see Table 4.1). When ratios are converted to percentages, the
positive mean changes of 1.3% and 1% on the two measures of non-
restrictive modifiers should also be compared to the mean changes
of all E 306 students and all "analytic-conventional" students.
As a group, all E 306 students wrote on the average nearly 1%
more of their T-units with final free modifiers on the A_2B_2 post-
test essays than on the pretest essays; and they wrote about 0.6
of 1% more words in final free modifiers on the posttest essays
than on the pretest essays (see Table 4.1). For all "analytic-
conventional" students (see Table 4.6), the reverse was true: those
students wrote about 0.4 of 1% fewer T-units with final free modifiers
on the posttest essays; and they put about 0.2 of 1% fewer words in
final free modifiers.

The recorded changes for the average holistic scores on both
essay sets for the present "analytic" students were smaller than
those observed for either all E 306 students (see Table 4.1) or
all "analytic-conventional" students (see Table 4.6). The 0.33
of a point mean positive change on the A_1B_1 essays for the present
18 students was 0.16 of a point less than the mean gain for all
E 306 students and 0.33 of a point smaller than that for all
"analytic-conventional" students. Similarly, the 0.44 average

positive gain for the 18 students in present comparison was 0.19
of a point and 0.28 of a point smaller than the mean gains for
all "analytic-conventional" students (see Table 4.6) and all
E 306 students (see Table 4.1), respectively.

For the 18 "synthetic-conventional" students used in the
present comparison, statistically significant changes were re-
corded for none of the six dimensions associated with the A_1B_1
essays and for but three of six dimensions associated with the
A_2B_2 essays. Unlike for change scores for the "analytic-convention-
al" students in the present comparison, the change scores for the
"synthetic-conventional" students are all positive.

Although none of the change score means were significant for
the A_1B_1 essays, some interesting comparisons can be made. The
average increase in word length of 15.39 for the A_1B_1 essays is,
for example, about 45 words smaller than the average for all
"synthetic-tutorial" students (see Table 4.13); but it is 14 words
larger than the average observed for all E 306 students (see Table
4.1) and 32 words larger than the average reported for the "analytic-
conventional" students in the present comparison. In this regard,
it should be remarked that the mean A_1B_1 posttest essay length is
about 60 words greater than that recorded for all E 306 students
(see Table 4.1) and about 45 words larger than the one recorded
for all "synthetic-tutorial" students (see Table 4.13). Although
rather large average gains were realized by the "synthetic-conventional"
students on clause and T-unit length, these gains tended merely to
increase mean T-unit and clause length to levels comparable to those
of all 180 E 306 students (see Table 4.1).

On the two dimensions associated with final free modifiers, these "synthetic" students did quite well. They wrote at least 1% more of their T-units with final free modifiers than did all 180 E 306 students and all "synthetic-tutorial" students. Comparably greater average gains were realized along the dimension of percentage of words in final free modifiers.

The mean gain in holistic score of 0.67 of a point for the "synthetic-conventional" students was 0.61 of a point higher than that observed for the "synthetic-laboratory/tutorial" classes examined in Principal Comparison 1 (see Table 4.38). It was also 0.18 of a point greater than the average gain for all 180 E 306 students (see Table 4.1), and 0.20 of a point greater than the average gain for all "synthetic-tutorial" classes (see Table 4.13).

The A_2B_2 essays for the "synthetic-conventional" students yielded statistically significant mean changes scores along three dimensions, with a fourth approach-significance at the .065 level of confidence. One of the more important mean changes here is that observed for essay length. While the average change for the A_2B_2 essays for the "synthetic-laboratory/tutorial" classes (see Table 5.2) did not reach statistical significance at the .05 level of confidence, the 117-word average increase for the present group was significant beyond the .001 level of confidence. The average changes for T-unit length and clause length are comparable to those observed for all 180 students (see Table 4.1), all "synthetic-tutorial" students (see Table 4.13), and the "analytic-conventional" students in the present comparison. The significant mean changes associated with the two syntactic indices focusing on the use of free modifiers are both slightly smaller than those recorded for

all "synthetic-tutorial" classes (see Table 4.13). However, they
are considerably larger than those recorded for all 180 E 306
students (see Table 4.1) and for the "analytic-conventional" stu-
dents in the present comparison. Although the mean change score
for the quality ratings did not reach statistical significance
for the "synthetic-conventional" classes, it was identical to the
mean change recorded for all 180 E 306 students (see Table 4.1) and
0.28 of a point greater than that for the "analytic-conventional"
students in the present comparison. However, it was 0.08 of a
point less than that of all "synthetic-tutorial" students (see
Table 4.13).

To determine whether one or the other curriculum could ac-
count for the differences between the posttest means on the two
sets of essays, we again conducted analyses of covariance, using
the pretest scores as covariates. As Table 5.10 and Table 5.11
indicate, only one curricular effect appeared. And it is clear

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Insert Table 5.10 about here.

Insert Table 5.11 about here.

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from a comparison of the mean lengths of the A_2B_2 posttest essays
for the "analytic-conventional" and "synthetic-conventional" stu-
dents that the "synthetic" curriculum effected longer essays than
the "analytic" curriculum did. Both curricula taught in a conventional

classroom setting appear to be equally effective in promoting change along the other eleven dimensions associated with the two essay sets.

We also compared the "analytic-conventional" classes and the "synthetic-conventional" classes along the five dimensions associated with writing-related skills and along the changes recorded for the Daly-Miller Writing Apprehension Test. These changes, together with paired T-tests of their significance, appear in Table 5.12 and Table 5.13. As Table 5.12 shows, the "analytic-conventional" students realized statistically significant

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Insert Table 5.12 about here.

Insert Table 5.13 about here.

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average gains on the language mechanics and the sentence patterns subtests of the McGraw-Hill Writing Test. These gains, in turn, produced a significant gain on the total score of the Writing Test. The average gain on the language mechanics subtest was only slightly larger than that observed for all 180 students in the present study (see Table 4.5) but about one-half point greater than that for all "analytic-conventional" students (see Table 4.10). For the sentence patterns subtest, the average gain was 1.06 points and 1.63 points greater than those recorded for all 180 students and for all "analytic-conventional" students, respectively. Not unexpectedly,

comparably larger mean gains occurred for the total score on the

Writing Test. The average gain of 5.31 points is 2.21 points

larger than that recorded for all "analytic-conventional" stu-

dents and 1.59 points greater than the one recorded for all 180

E 306 students. Although the present "analytic-conventional"

students did not realize statistically significant average gains

on the paragraph comprehension component of the McGraw-Hill Reading

Test, that gain approached statistical significance at the .074

level of confidence. Although in itself not significant at or

beyond the .05 level of confidence, the average gain in reading

comprehension of 1.76 points exceeds by 0.58 of a point the average

gain recorded in Table 4.10 for all "analytic-conventional" stu-

dents and by 0.98 of a point the average gain observed for all 180

E 306 students (see Table 4.5).

When Table 5.13 and Table 5.12 are compared some interesting

differences, as well as some similarities, appear between the two

groups in the present comparison. For example, the mean change

for the 18 "synthetic" students on the language mechanics subtest

is 3.94 points, a positive change 0.56 of a point larger than the

one recorded for the 18 "analytic" students. A similar difference

between the mean changes on the sentence patterns subtest can be

observed, with the mean change score for the "synthetic" students

0.68 of a point larger than the one for the 18 "analytic" students.

On the paragraph patterns subtest the "analytic" students realized

only a very slight gain of 0.06 of a point, whereas the "synthetic"

students moved in a negative direction by 1.31 points on the average.

The difference between the total score mean changes, both of which

were positive and highly significant, is only 0.12 of a point. On

the paragraph comprehension subtest, the difference between the
two groups' performances are especially important. Whereas the
"analytic" students realized a positive mean change that approached
statistical significance, the "synthetic" students on the average
registered a negative change. When the positive change and the
negative change for the two groups are summed, the difference be-
tween the change score means is seen to be 2.17 points. Neither
of the two groups realized significant change on the Daly-Miller
Writing Apprehension Test.

Analyses of covariance were also performed to compare the
objective test posttest mean scores recorded for the "analytic-
conventional" and the "synthetic-conventional" classes. In those
analyses, the pretest scores of each group were entered as co-
variates. With these analyses we sought to determine whether the
change scores recorded in Table 5.12 and Table 5.13 could be at-
tributed to the effect of either the "synthetic" or the "analytic"
curriculum. As Table 5.14 indicates, no course effects were ob-
served, in spite of the differences between the mean change scores

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Insert Table 5.14 about here.

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of the two groups. That is to say, neither the "analytic" curriculum
nor the "synthetic" curriculum was shown to be more effective than
the other in producing changes along the several dimensions of
the objective measures of writing-related skills or for the Daly-
Miller Writing Apprehension Test.

Principal Comparison 2 was designed to determine whether the five significant course effects found for the "analytic-conventional" E 306 option studied in Principal Comparison 1 were attributable to the curriculum. Given the present analyses of covariance for the A_1B_1 and the A_2B_2 essays and the objective measures for the "analytic-conventional" and the "synthetic-conventional" classes, we cannot conclude that the course effects determined in Principal Comparison 1 were in fact caused by the "analytic" curriculum. In the present comparison the only statistically significant curriculum effect that was found was for the average length of the A_2B_2 essays. That effect was attributable not to the "analytic" curriculum but to the "synthetic" curriculum. It should be noted that a course effect was found for the same dimension in Principal Comparison 1; but that effect, significant beyond the .003 level of confidence, was caused by the "analytic" course, not the "synthetic" course. Tentatively, we can thus conclude that with the one exception noted above, the two curricula are equally effective or ineffective when they are taught in a conventional classroom setting. Our analyses also suggest that either the "tutorial" component or the "computer-assisted laboratory" component of the "synthetic-laboratory/tutorial" courses examined in Principal Comparison 1 is instructionally less effective than "conventional" classroom instruction in writing. These latter questions will be explored in a subsequent comparison.

Principal Comparison 3: "Analytic-Conventional" Students (N=18) Compared with "Analytic-Syllabus-Conventional" Students (N=18). From the analyses conducted for Principal Comparison 1

and Principal Comparison 2, it cannot be concluded whether the effects of the "analytic" courses are attributable to the Rodi-syllabus. This is the question addressed in Principal Comparison 3. As in the other principal comparisons, the teacher variable in Principal Comparison 3 is rigorously controlled. Each of the two teachers involved taught one section which used only the Rodi-syllabus, and each taught one section which used Adelstein and Pival's The Writing Commitment (1976) together with the Rodi-syllabus. Even though Principal Comparison 3 was designed to test for the effect of the rhetoric text, the text variable could not be as rigorously controlled as, ideally, it might have been. Ideally, different rhetoric texts would have paralleled different curricula, as they did in Principal Comparison 2. The four classes used in the present comparison were, however, all taught the "analytic" curriculum, and both teachers organized their two classes around the chapters in the Rodi-syllabus. In two of the four classes, one taught by each of the two teachers, the "analytic" curriculum as presented in the Rodi-syllabus was supplemented by rhetoric-related topics in The Writing Commitment. All other in-structional materials--e.g., handbook and reader--were the same for all four classes.

The pretest and posttest essay data for the 18 "analytic-conventional" students and the 18 "analytic-syllabus-conventional" students used in the present comparison are summarized in Table 5.15 and Table 5.16. These tables also report the results of paired

Insert Table 5.15 about here.

Insert <u>Table 5.16</u> about here.

T-tests of the changes for the two sets of essays for both groups.
<u>Table 5.15</u> indicates that statistically significant changes along
four dimensions occurred for the group that used <u>The Writing</u>
<u>Commitment</u>, while a fifth approached significance at the .07 level
of confidence. Of the four changes which were found significant
and the fifth which approached significance, all but one were
negative gains. That is to say, the pretest essay means for those
five dimensions were, with one exception, all larger than the
posttest means. Indeed, of the changes reported in <u>Table 5.15</u>,
only four of the twelve represented positive gains--the changes
in mean word length and mean holistic score for both essay sets.
The change in mean word length of the A_1B_1 essays was over 12
words greater than that observed for all 180 E 306 students (see
<u>Table 4.1</u>) and over 33 words greater than that for all "analytic-
conventional" students (see <u>Table 4.6</u>). The mean change on the
A_2B_2 essays was about the same as that recorded for "analytic-
conventional" students, but it was about 30 words smaller than
that for all 180 students (see <u>Table 4.1</u>). It is also noteworthy
that the pre- and posttest means for both essay sets are consider-
ably smaller than those observed both for all 180 students and for
all "analytic-conventional" students.

Table 5.15 also indicates that while a rather large mean
positive gain was found for the A_1B_1 holistic scores, a rather
small one was found for the A_2B_2 holistic score. The average gain

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of 1.44 points for the A_1B_1 essays is 0.95 of a point larger than that recorded for all 180 students (see Table 4.1) and 0.78 of a point larger than that of all "analytic-conventional" students (see Table 4.6). The smaller gains for both of these two latter groups, it will be remembered, were highly significant. The average gain for the A_2B_2 holistic scores was much smaller than the gain on A_1B_1 essays. The registered mean gain of 0.39 of a point is 0.33 and 0.24 of a point smaller than those recorded for the 180 students (see Table 4.1) and for all "analytic-conventional" students (see Table 4.6), respectively. These gain scores would seem to suggest that these two "analytic-conventional" classes in the present comparison better learned to write narrative and descriptive essays based on personal experience than they did to argue objectively for a particular position on a controversial issue. However, an examination of the pretest A_2B_2 holistic scores and the posttest scores suggests that, in comparison to all 180 E 306 writers studied (see Table 4.1), these 18 students were already fairly competent writers at the beginning of the semester. The pretest A_2B_2 average holistic score was 4.89, 0.42 of a point larger than the average pretest score for all 180 students. The 0.42 of a point difference represents about 58% of the total change recorded for all 180 students. In contrast, on the A_1B_1 essays, with a pretest mean of only 4.06 compared with 4.52 for all 180 students (see Table 4.1), these students had a long way to go; and they did.

The mean changes on the syntactic measures for the present group of "analytic-conventional" students were all negative; and

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three of these eight negative changes were statistically significant well beyond the .05 level of confidence. These changes are somewhat puzzling. While not altogether inconsistent with the changes recorded for all "analytic-conventional" students (see Table 4.6), these changes do suggest that the students were writing shorter and simpler sentences at the end of the semester than they were at the beginning. These negative syntactic gains may thus suggest that one or both of the two teachers involved in the present comparison strongly favored a "simple," direct writing style over a more complex, elaborate style. If the syntactically simpler style were systematically taught, it was taught well: the mean holistic scores for both sets of posttest essays exceed those recorded for all 180 E 306 students (see Table 4.1). It should also be pointed out in this connection that either statistically insignificant gains or negative gains frequently appear in reports of experimental composition research for "control" groups. Typically, these "control" groups were taught an "analytic" curriculum.

The data summarized in Table 5.16 for the two "analytic-syllabus-conventional" classes indicate that while half of the twelve mean change scores represented positive change, none was statistically significant. As was observed of the mean essay lengths summarized in Table 5.15, the average length of the essays written by the "syllabus" students is generally smaller than that reported for all 180 E 306 students (see Table 4.1) and for all "analytic-conventional" students (see Table 4.6). It is unclear to us why these smaller means occurred for both groups on the present comparison on both the pretest and posttest essays in both essay sets.

Although smaller average essay lengths were observed for both groups in the present comparison, some noticeable differences between the two groups also were found, especially for the syntactic indices. Whereas the "analytic-conventional" group in the present comparison lost considerable ground on the four A_1B_1 syntactic indices, only the average T-unit length of the "syllabus" students decreased over the semester. That decrease, however, served to bring the posttest means for that group on that index more in line with the posttest means noted for all 180 students (see Table 4.1). The small gain in average length on the A_1B_1 essays, although about twice as large as that observed for all 180 students (see Table 4.1), resulted in posttest mean clause lengths comparable to those for all students but still 1.31 words longer than those for the "analytic-conventional" students used in the present comparison. The positive mean gains recorded for the "syllabus" students for the two ratios associated with final free modifiers indica. a heavier reliance on free modifiers in the A_1B_1 essays of the "syllabus" students than in the A_1B_1 essays of the "analytic-conventional" students used in the present comparison, of all "analytic-conventional" students (see Table 4.6), and of all 180 students (see Table 4.1).

The average pretest-posttest change for the holistic scores on the A_1B_1 essays for the "syllabus" students was 0.19 of a point, which was 0.27 of a point less than that for all "analytic-conventional" students (see Table 4.6), 0.10 of a point less than that for all 180 students (see Table 4.1) and 1.05 points less than that of the "analytic-conventional" students in the present comparison. Not only was the average gain for the holistic scores

less than it was for the students in those other three groups, but so was the mean score on the posttest A_1B_1 essays. In fact, the mean holistic score on the A_1B_1 posttest essays for the "syllabus" students was over three-fourths of point smaller than that of the "analytic-conventional" students in the present comparison.

As with the A_2B_2 change scores for the "analytic-conventional" students in the present comparison, two of those change scores for the "syllabus" students were positive and four were negative. Negative changes were recorded for both groups on all four syntactic indices, while positive changes were found for average essay length and mean holistic score. For the "syllabus" students, however, the positive changes were larger and the negative changes for mean T-unit and mean clause were smaller. The negative changes observed for the two ratios associated with free modifiers were larger than those recorded for the "analytic-conventional" students in the present comparison, as were the positive changes in average essay length and mean holistic score. All of the posttest means recorded for these "syllabus" students are comparable to those observed for all "analytic-conventional" students (see Table 4.6). With the exception of the two ratios associated with final free modifiers, the posttest means for the "syllabus" students are also compatible with those observed for all 180 students (see Table 4.1). Whereas the "syllabus" students used, on the average, final free modifiers in 3% of the T-units they wrote, the entire sample of 180 students used such modifiers, on the average, in 4.8% of their T-units. Similarly, whereas 1.6% of all words in the A_2B_2 essays

of the "syllabus" students appeared in final nonrestrictive modifiers, 2.7% of all words used by the 180 students appeared in final free modifiers.

To determine the effects of the "rhetoric text" on the post-test means displayed in Table 5.15 and Table 5.16, we conducted analyses of covariance on each, using in each case the pretest scores as covariates. The results of these analyses are presented in Table 5.17 and Table 5.18.

Insert Table 5.17 about here.

Insert Table 5.18 about here.

As Table 5.17 indicates, a statistically significant effect was found only for mean clause length on the A_1B_1 essays. That effect, which favors the "syllabus" classes, is largely attributable to the fact that on this dimension the "analytic-conventional" students regressed slightly during the ester while the "syllabus" students gained slightly. Although statistically significant effects were found for none of the remaining five dimensions, the computed F-ratios for four of these dimensions approached significance. Three of these F-ratios indicate ever so tentatively that the Rodi syllabus had a positive effect on mean T-unit length, mean ratio of T-units with final free modifiers to total T-units, and mean ratio of words in final free modifiers to total words. The fourth

F-ratio suggests, again only in a tentative way, that the use of The Writing Commitment in conjunction with the Rodi syllabus had some bearing on the holistic scores of the A_1B_1 essays. Thus we would tentatively suggest that the Rodi syllabus used without The Writing Commitment effected certain syntactic changes in the type of discourse represented by the A_1B_1 writing topics, while its use in conjunction with The Writing Commitment had some effect on the overall quality of such written discourse.

The analyses of covariance for the dimensions analyzed for the A_2B_2 essays are represented in Table 5.18. These analyses yielded results much less inconclusive than those derived from the analyses of the A_1B_1 essays. Clearly, neither the Rodi syllabus used alone nor The Writing Commitment used in conjunction with the Rodi syllabus had a greater effect on mean essay length, the two ratios associated with final nonrestrictive modifiers, or holistic score. Statistically significant effects were, however, found for mean T-unit length and mean clause length. These effects, significant beyond the .009 level of confidence, clearly favor the Rodi-syllabus used without The Writing Commitment.

We also compared the performances of the two groups on the objective measures of writing-related skills and of writing apprehension. The pre- and posttest means for the two groups, together with paired T-tests of the change scores for both groups, are presented in Table 5.19 and Table 5.20. Table 5.19 reveals

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Insert Table 5.19 about here.

Insert _Table 5.20_ about here.

that none of the changes for the "analytic-conventional" students,

the students exposed to both _The Writing Commitment_ and the Rodi

syllabus, reached statistical significance at the .05 level of

confidence. The positive gains in reading comprehension did,

however, approach significance at the .054 level. The average

change score on this measure of 2.27 points is, it should be

noted, 1.09 points higher than the average change recorded by all

"analytic-conventional" students (see _Table 4.10_), a change sig-

nificant beyond the .004 level of confidence. This average change

of 2.27 points was also higher by 1.49 points than the average change

noted for all 180 students, change which was determined to be statistic-

ally significant beyond the .03 level of confidnece. The change

recorded for writing apprehension was neither large nor significant,

a finding compatible with those for every other group of students

investigated in the present study. Of the four sets of scores on

the _McGraw-Hill Writing Test_, two were positive, one was negative,

and one represented no change at all; but none of the change scores

was statistically significant. The mean change of 1.71 points

observed for the language mechanics subtest was smaller by 1.41

points than the average change noted for all 180 students (see

Table 4.5) and smaller by 1.03 points than that for all "analytic-

conventional" students (see _Table 4.10_). The average change, a

negative one, on the sentence patterns subtest was 0.54 of a

point less than that of all "analytic-conventional" students (see

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Table 4.10) and 1.11 points less than that of all 180 students
(see Table 4.5). For the present "analytic-conventional" stu-
dents, the average change on the paragraph patterns subtest
was zero. The total writing score mean gain was 1.41 for the
present students. This figure is 1.69 points lower than the
one for all "analytic-conventional" students (see Table 4.10)
and 2.31 points lower than the one for all 180 students (see Table 4.5).

Table 5.20 reveals that substantially larger changes on two
dimensions of the Writing Test were found for the "syllabus" stu-
dents. The mean change for the "syllabus" students cn the language
mechanics subtest was 4.29 points, 2.58 points higher than that
observed for the "analytic-conventional" students in the present
comparison. As Table 5.20 also indicates, this mean change for
the "syllabus" students was significant beyond the .001 level of
confidence. This highly significant and large positive gain on
the language mechanics subtest produced a statistically significant
average change in total score. Significant beyond the .02 level
of confidence, this mean change for the "syllabus" students-
was 0.87 of a point greater than that for all 180 students (see
Table 4.5), 1.49 points larger than that for all "analytic-
conventional" students (see Table 4.10), and 3.18 points greater
than that for the "analytic-conventional" students in the present
comparison. Although the average gain of 1.11 points on the
reading comprehension measure was not statistically significant,
that gain was actually larger than the statistically significant
average gain recorded for all 180 students (see Table 4.5) and
only slightly smaller than the gain for "analytic-conventional"

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students (see Table 4.10). The average gain in reading compre-
hension for the "syllabus" students was, however, 1.16 points
smaller than that observed for the "analytic-conventional"
students in the present comparison.

To determine the effects of the "rhetoric text" on student
performances on these objective measures, we ran analyses of co-
variance on the posttest scores, using the corresponding pretest
scores as covariates. The results of these analyses appear in
Table 5.21. This table indicates that neither the Rodi syllabus

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Insert Table 5.21 about here.

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used alone nor The Writing Commitment used in conjunction with
the Rodi syllabus had a greater effect on the posttest means. Both
appear to be equally effective in some ways and equally ineffective
in others.

The analyses we performed in connection with Principal
Comparison 3 allow a few speculations. First, while neither
"rhetoric" nor combination of "rhetorics" seems to be more effective
in producing qualitative changes in the A_2B_2 essays, the argumenta-
tive essays, the Rodi syllabus itself seems to have an adverse
effect on the quality of the A_1B_1 essays. On the other hand, it
may have effected longer T-units and clauses and a greater use of
free modifiers. At any rate, the question of the relative ef-
fectiveness of the Rodi syllabus and The Writing Commitment is
a moot one because one has been dropped altogether from the
"analytic" curriculum and the other's use is limited to that of a
training manual for new teaching assistants.

Principal Comparison 4: "Analytic-Conventional" Students
(N=18) Compared with "Analytic-Tutorial" Students (N=18). This
comparison was designed to test for the effect of the instruc-
tional method on the writing and writing-related performances
of students studying the "analytic" curriculum. The students
taught in a "conventional" classroom setting and the students
taught with the "tutorial" method used the same set of instruc-
tional materials and followed the same course outline, which was
determined in large part by the Rodi syllabus.

The pretest and the posttest essay data for the 18 "analytic-
conventional" students and the 18 "analytic-tutorial" students
used in the present comparison are summarized in Table 5.22 and
and Table 5.23. These tables also present the results of paired

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Insert Table 5.22 about here.

Insert Table 5.23 about here.

T-tests of the mean change scores observed for the two groups
along the twelve dimensions associated with the A_1B_1 essays and
the A_2B_2 essays.

Table 5.22 shows that mean length of the A_1B_1 posttest es-
says was over 19 words shorter than that of the pretest essays for
the 18 "analytic-conventional" students. This negative change,
although not statistically significant, resulted in A_1B_1 posttest

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essays which were, on the average, 42.87 words shorter than the A_1B_1 posttest essays of all 180 E 306 students (see Table 4.1) and 34.52 words shorter than the A_1B_1 posttest essays of all "analytic-conventional" students (see Table 4.6). The present "analytic-conventional" students realized an average positive gain in the number of words on the A_2B_2 essays; and that gain, although small, was comparable to the average gains recorded for all "analytic-conventional" students (see Table 4.6). However, the A_2B_2 posttest essays were shorter, on the average, than those of either of the other two groups. The average word length on the A_1B_1 posttest essays of the present "analytic-conventional" students was 390 words. Thus the A_1B_1 posttest essays for these 18 students were on the average 87.4 words shorter than those of all 180 students (see Table 4.1) and 64.4 words shorter than those of all "analytic-conventional" students (see Table 4.6).

Of the mean change scores along the eight syntactic dimensions for these 18 "analytic-conventional" students on the two essay sets, only one was significant beyond the .05 level of confidence. That change score--the one for mean T-unit length on the A_1B_1 essays --suggests that the growth along that dimension allowed the students to achieve mean T-unit lengths on their posttest essays that were nearly identical to those recorded for all 180 students (see Table 4.1) and for all "analytic-conventional" students (see Table 4.6). The same observation holds true for the mean change in clause length, even though that change was not statistically significant. The positive changes for this group along the two dimensions associated with final nonrestrictive modifiers are

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another matter. The mean changes on these indices are sub-
stantially larger than those recorded for all 180 students (see
Table 4.1) and for all "analytic-conventional" students (see
Table 4.6). The result of these larger change scores were A_1B_1
posttest essays which had at least 1.3% more T-units with final
free modifiers than did the comparable essays of all 180 students
(see Table 4.1) and of all "analytic-conventional" students
(see Table 4.6). Similarly, the posttest A_1B_1 essays of these
18 students used about 1% more of their total words in final free
modifiers than did the A_1B_1 posttest essays in the other two groups.
The syntactic changes recorded for these 18 students on the A_2B_2
essays were mixed changes, two positive and two negative. Although
the positive change in mean T-unit length was insignificant statis-
tically, the A_2B_2 posttest mean for these "analytic-conventional"
students was more than a half a word larger than the comparable
means for all 180 E 306 students (see Table 4.1) and for all
"analytic-conventional" students (see Table 4.6). The mean changes
recorded for the final free modifiers were, however, both negative.
As a result, a lower percentage of T-units with final free modifiers
appeared in the A_2B_2 posttest essays of these 18 students than
appeared in the corresponding posttest essays of all 180 students
(see Table 4.1) and of all "analytic-conventional" students (see
Table 4.6). The same can also be said of the mean percentage of
total words used in final free modifiers in the A_2B_2 posttest
essays of the 18 "analytic-conventional" students.

As Table 5.22 shows, these 18 students also realized positive
gains on the holistic scores for both essay sets. However, neither

of these average gains was found to be statistically significant beyond the .05 level of confidence. In fact, the average pretest-posttest gain on the A_1B_1 essays was quite small, the improvemnt in writing quality registering only 0.11 of a point on a seven-point scale. This almost negligible gain resulted in a mean holistic score on the A_1B_1 posttest essays that was 0.41 and 0.58 of a point less than those recorded for all 180 E 306 students (see Table 4.1) and all "analytic-conventional" students (see Table 4.6), respectively. Although the average gain on the A_2B_2 essays was not statistically significant, that gain equalled that of all 180 students (see Table 4.1) and was somewhat larger than that for all "analytic-conventional" students (see Table 4.6). However, the posttest mean holistic score was 0.64 and 0.82 of a point less than those recorded for the other two groups (see Table 4.1 and Table 4.6). In this connection, it should be pointed out that the average pretest holistic score for this group of 18 students was also substantially lower than those of the other two groups.

As with the mean change scores of the 18 "analytic-conventional" students in the present comparison, only one of the mean change scores for the 18 "analytic-tutorial" students reached statistical significance beyond the .05 level of confidence. While eight of the mean change scores for the former group were positive, only six for the "tutorial" students were; and four of those were for the A_2B_2 essays.

Table 5.23 shows that the 18 "tutorial" students wrote, on the average, posttest essays shorter than the pretest essays on

the A_1B_1 topics, while the reverse was true for the essays written on the A_2B_2 topics. Although an average negative change of 37.61 words in essay length between the pretest and posttest A_1B_1 essays was observed for the "analytic-tutorial" students, the mean length of the posttest essays was about the same as that recorded for all 180 E 306 students (see Table 4.1) and for all "analytic-conventional" students (see Table 4.6). However, the mean length of the A_1B_1 essays for these "tutorial" students was about 45 words larger than that recorded for the 18 "analytic-conventional" students in the present comparison. In contrast to that found for the A_1B_1 essays, the mean change in essay length for the "tutorial" students' A_2B_2 essays was positive. The average posttest gain over the pretest means for essay length was 21.67 words. This mean change falls in between those recorded for all 180 E 306 students (see Table 4.1) and for all "analytic-conventional" students (see Table 4.6); and the posttest essay means are comparable to those observed for both of the other two groups. However, the average length of the A_2B_2 posttest essays of the "tutorial" students was nearly 79 words larger than that of the 18 "analytic-conventional" students in the present comparison.

There were also some marked differences between the two groups in the present comparison along the dimensions of the eight syntactic indices. Whereas all of the recorded syntactic changes on the A_1B_1 essays were positive for the 18 "conventional" students, only two were positive for the "tutorial" students. Both groups showed positive average gains in T-unit and clause length; and although the posttest means on both measures are slightly larger

for the 18 "conventional" students, those means are roughly
equivalent to the ones recorded for the "tutorial" students.
As were the posttest means along these two dimensions for the 18
"conventional" students, those for the 18 "tutorial" students com-
pare well with the A_1B_1 posttest means recorded for all 180
E 306 students (see Table 4.1) and for all "analytic-conventional"
students (see Table 4.6). Along these two measures for the A_2B_2
essays, the 18 "tutorial" students regressed somewhat, producing
posttest means that were smaller than those observed for the 18
"conventional" students in the present comparison. Although
the average changes in T-unit and clause length for the present
"tutorial" students were negative, the resultant posttest means
are comparable to those produced by all 180 E 306 students (see
Table 4.1) and all "analytic-conventional" students (see Table 4.6).

Differences between the two groups in the present comparison
also occurred along the four dimensions associated with the use
of final free modifiers. For the 18 "conventional" students the
average changes on the A_1B_1 essays were positive, while on the
A_2B_2 essays they were negative. Just the reverse was true for
the "tutorial" students: they registered negative gains on the
A_1B_1 essays and positive ones on the A_2B_2 essays. Although nega-
tive mean changes were recorded for these indices on the A_1B_1
essays of the 18 "tutorial" students, the posttest means are
still somewhat higher than those recorded for all 180 students
(see Table 4.1), for all "analytic-conventional" students (see
Table 4.6), and for the 18 "analytic-conventional" students in
the present comparison. In contrast to these negative changes

of the "tutorial" students on the A_1B_1 essays stand positive mean changes on the A_2B_2 essays. Although these average changes were not statistically significant, they did produce A_2B_2 posttest means which were substantially higher than those recorded for all 180 students (see Table 4.1), all "analytic-conventional" students (see Table 4.6), and the 18 "analytic-conventional" students in the present comparison. In terms of the percentage of T-units with final free modifiers, these differences indicate that, on the average, the present "analytic-tutorial" students wrote a higher percentage of T-units with final free modifiers than did the present "analytic-conventional" students; the 180 E 306 students; and all "analytic-conventional" students respectively.

The A_1B_1 and the A_2B_2 average holistic scores also differed for the two groups in the present comparison. The 18 "analytic-conventional" students realized a small mean change between the pretest and posttest A_1B_1 essays but still produced posttest essays with an average score smaller than those recorded for all 180 students and for all "analytic-conventional" students. The 18 "analytic-tutorial" mean change on the A_1B_1 essays was negative, the students producing A_1B_1 posttest essays that were judged, on the average, 0.39 of a point lower in quality than the pretest essays. However, the posttest mean for the A_1B_1 essays was still larger by 0.15 of a point than that observed for all 180 E 306 students (see Table 4.1) and was only 0.02 of a point smaller than that recorded for all "analytic-conventional" students (see Table 4.6). In comparison to the 18 "analytic-conventional" students in the present comparison, however, these 18 "analytic-tutorial"

students wrote A_1B_1 posttest essays that were judged 0.56 of a point better. On the A_2B_2 topics, the 18 "analytic-tutorial" students wrote essays which improved, on the average, by 0.72 of a point, a mean change identical to that of the 18 "analytic-conventional" students in the present comparison. That average gain is also identical to that recorded for all 180 E 306 students (see Table 4.1) but is 0.09 of a point higher than the average gain of all "analytic-conventional" students (see Table 4.6). While the mean gain is nearly identical to the mean gains recorded for these other three groups of students, the mean score for the A_2B_2 posttest essays is not. The means score of 4.89 is 0.30 of a point lower than the mean observed for all 180 students (see Table 4.1), and 0.48 of a point lower than that for all "analytic-conventional" students (see Table 4.1), and 0.4? of a point lower than that for all "analytic-conventional" students (see Table 4.6). However, the 4.89 average score is 0.34 of a point higher than the average gain of the 18 "analtyic-conventional" students in the present comparison.

To determine whether the two instructional methods--the "conventional" and the "tutorial"--had any effect on the posttest scores of the two groups taught the "analytic" curriculum in the present comparison, we again ran a series of analyses of covariance to compare the A_1B_1 and A_2B_2 posttest essay means of the two groups. As in previous such analyses, the pretest scores were entered into the analyses as covariates. As Table 5.24 and Table 5.25

Insert Table 5.24 about here.

Insert _Table 5.27_ about here.

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indicate, significant effects were found only for the two indices measuring the use of final free modifiers in the A_2B_2 essays. Obviously, the "tutorial" method was more effective than the "conventional" in enhancing the use of final free modifiers. No other significant effects were observed, indicating that neither method was more effective than the other in causing the measured changes in the written products of the 36 students in the present comparison.

We also compared the performances of these 18 "analytic-conventional" students and 18 "analytic-tutorial" students on the objective measures of writing related behaviors. The pretest and posttest means of the two groups, together with T-tests of the mean changes for these objective measures, appear in _Table 5.26_ and _Table 5.27_. These tables indicate that the "analytic-conventional" students realized a significant average gain on the

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Insert _Table 5.26_ about here.

Insert _Table 5.27_ about here.

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language mechanics subtest of the _McGraw-Hill Writing Test_, while the "analytic-tutorial" students achieved statistically significant mean gains on both the language mechanics subtest

and the total score. The average changes observed for neither
group were significant for the paragraph comprehension subtest
of the McGraw-Hill Reading Test or for the Daly-Miller Writing
Apprehension Test.

Some noticeable differences between the two groups do,
however, show up. First, the mean change of the 18 "analytic-
tutorial" students on the language mechanics subtest was 0.79
of a point higher than that recorded for all 180 students (see
Table 4.5), 1.07 points higher than the mean change for all
"analytic-conventional" students in the present comparison.
Second, whereas the mean change for the 18 "analytic-conventional"
students on the sentence patterns subtest was a negative one, the
mean change for the 18 "analytic-tutorial" students was positive.
Although this change was not found to be statistically significant
beyond the .05 level, it was slightly larger than that recorded
for all 180 E 306 students (see Table 4.5), an average gain which
was statistically significant beyond the .001 level of confidence.
On the paragraph patterns subtest, negative mean change scores were
recorded for both groups. A fourth difference between the two
groups in the present comparison can be seen in the respective
mean changes recorded for the total score on the McGraw-Hill Writing
Test. On the total score, the 18 "analytic-tutorial" students
registered a mean change 3.01 points larger than the average change
of the 18 "analytic-conventional" students. This higher average
gain was also 0.56 of a point higher than that recorded for all
180 E 306 students (see Table 4.5) and 1.18 points higher than
that recorded for all "analytic-conventional" students (see Table 4.10).

On the paragraph comprehension subtest of the <u>McGraw-Hill</u>
<u>Reading Test</u>, neither of the groups realized statistically sig-
nificant changes, although both observed mean change scores
were positive.   The larger of the two mean change scores, the
one for the 18 "analytic-conventional" students, was 0.14 of a
point less than the average gain observed for all 180 students
(see <u>Table 4.5</u>), a gain which was statistically significant be-
yond the .021 level of confidence.   However, the mean change
for the 18 "analytic-conventional" students was 0.54 of a point
smaller than that recorded for all "analytic-conventional" students
(see <u>Table 4.10</u>).

To determine whether any of the mean changes on the objective
measures of writing-related behaviors for either of the two groups
could be attributed to the effects of the instructional methods,
we used analyses of covariance to compare the posttest means of
the two groups, entering the pretest scores in the analyses as
covariates.   As <u>Table 5.28</u> reveals, neither instructional method

Insert <u>Table 5.28</u> about here.

can be judged more effective than the other in producing changes
along the six dimensions of the objective measures of writing-
related behaviors.

The results of Principal Comparison 4 do not allow a con-
clusion strongly favoring either method of instruction for the 36
students studying the "analytic" curriculum, even though we found
the "tutorial" method more effective in promoting the use of
final free modifiers in the A_2B_2 essays.   In our judgment, unless

an instructional method promotes higher posttest holistic scores on one or the other sets of essays, it cannot be singled out as more effective than another. In this comparison the incoming abilities of both groups of students presented some difficulties in the analyses. Notice, for example, the apparently large difference in incoming level of performance on the A_1B_1 essays. The pretest mean for the 18 "analytic-tutorial" students is 1.06 points higher than that for the 18 "analytic-conventional" students. When we compared the A_1B_1 posttest means of the "tutorial" students with those of all 180 students and all "analytic-conventional" students, we found them to be comparable. This may suggest that at the beginning of the semester the "analytic-tutorial" students had already reached their potential for writing on essay topics such as those represented by the A_1B_1 topics. If this be the case, we suspect that no instructional method would have produced larger scores until the students as a group had grown considerably, both intellectually and psychologically.

Principal Comparison 5: "Analytic-Tutorial" Students (N=18) Compared with "Synthetic-Tutorial" Students (N=18). This last of the 10 comparisons in the present study was designed to test for the effect of the curriculum when the teacher variable and the instructional variable--in this case, "tutorial" instruction without the computer-assisted component--were controlled. With the exception of two different groups of students, two different teachers, and a different instructional method, Principal Comparison 5 is identical to Principal Comparison 2. Both were designed to test for the same effect.

The pretest and posttest means for the A_1B_1 and the A_2B_2 essays for both groups are presented in Table 5.29 and Table 5.30. These tables also report T-tests of the mean change for both groups on both sets of essays.

Insert Table 5.29 about here.

Insert Table 5.30 about here.

As these tables indicate, the average word length of the A_1B_1 posttest essays for both groups was greater than the average length of the pretest essays. While the mean increase for the "analytic" students was not statistically significant, the mean increase of 84.89 words for the "synthetic" students was significant beyond the .001 level of confidence. This average increase in essay length was nearly 78 words greater than the average increase observed for the "analytic" students in the present comparison. But it was also considerably larger than those recorded for several of the other groups examined in the present study. This average gain in essay length was over 39 words longer than that recorded for all "synthetic" students (see Table 4.26), over 62 words greater than the average gain recorded for all "tutorial" students (see Table 4.19), and over 103 words greater than the mean change observed for all "analytic" students (see Table 4.25).

Large differences between the mean change scores on the A_2B_2 essays for the two groups in the present comparison was also observed.

As with the mean changes observed for the A_1B_1 essays, the average change for the "analytic" students was not statistically significant, while the mean change for the synthetic students was significant, again beyond the .001 level of confidence. The mean gain in essay length of 146.61 words for the "synthetic" students was nearly 98 words greater than the average change recorded for the "analytic" students in the present comparison. It was similarly greater than the mean changes recorded for three other groups not unrelated to the present comparison. The present "synthetic' students' mean gain in A_2B_2 essay length was about 59 words greater than that for all "synthetic" students (see Table 4.26), but it was nearly 93 words greater than that recorded for all "tutorial" students (see Table 4.19) and well over twice as large as the average gain for all "analytic" curriculum students (see Table 4.25). This large gain for the present "synthetic" students needs, however, to be viewed with reference to the average length of their A_2B_2 pretest essays. Although the average length of approximately 383 words for the present "synthetic" students' A_1B_1 pretest essays was only about 24 words smaller than that of their "analytic" counterparts, this average essay length was considerably smaller than those recorded for all "synthetic" students (see Table 4.26), all "tutorial" students (see Table 4.19), and all "analytic" students (see Table 4.25). Thus it would seem that at least part of the large gain for the present "synthetic" students can be explained with reference to their shorter pretests, as well as with reference to their longer posttest essays.

The "synthetic" and the "analytic" students in the present comparison also differed with respect to the gains measured by the

syntactic indices. The changes recorded for both groups on the A_1B_1 essays in mean T-unit length are particularly noteworthy. Whereas the "analytic" students realized a mean gain of 0.35 words which was not statistically significant, the "synthetic" students managed a loss in mean T-unit length of 1.56 words. This large regression was significant beyond the .023 level of confidence, and it represented the only statistically significant loss in mean T-unit length for any of the several groups of students we examined in the present study. So great was the average loss for the "synthetic" students that their A_1B_1 posttest mean T-unit length, while 0.28 of a word longer than that of the present "analytic" students, was about a half a word shorter than the mean T-unit lengths recorded for all "analytic" students (see Table 4.25) and all "tutorial" students (see Table 4.19) and about three-fourths of a word-shorter than the mean T-unit length of all "synthetic" students (see Table 4.26). Both of the groups regressed somewhat in average clause length on the A_1B_1 essays, but the posttest mean for the "synthetic" students was about a half of a word larger than that of the present "analytic" students.

Some interesting differences between the two groups also appear when the changes in mean T-unit and clause length for the A_2B_2 essays are compared. While the "analytic" group realized 0.28 of word greater gain than the "synthetic" students, the posttest mean for the "synthetic" group was over two words larger than that of the "analytic" group. It was also at least one word larger than the means recorded for all "analytic" students (see Table 4.25) and for all "tutorial" students (see Table 4.19) and about one half of a word larger than that observed for all "synthetic"

students (see Table 4.26). The mean clause length for the A_2B_2
essays showed a very slight loss for the "analytic" students and
a gain of 0.41 of a word for the "synthetic" students. This
average gain for the "synthetic" students was about one word larger
than that recorded for the "analytic" students in the present com-
parison. The "synthetic" posttest mean was also 0.36 of a word
larger than that of all "synthetic" students, 0.65 of a word longer
than that of all "tutorial" students, and 0.91 of a word longer
than that of all "analytic" students.

Although the 18 "analytic" and the 18 "synthetic" students
realized both comparable A_1B_1 posttest means and comparable A_1B_1
mean changes scores on the two indices designed to measure the use
of final free modifiers, significant differences appeared between
the two groups along these dimensions on the A_2B_2 essays. As
Table 5.29 and Table 5.30 show, the "synthetic" students realized
positive mean changes on both indices, while the "analytic" students
regressed on both. In part a result of change in opposite directions
for the two groups, the posttest means for the 18 "synthetic" stu-
dents on both indices are substantially larger than those for the
18 "analytic" students. Converted to percentages, the ratios
cited in the two tables indicate that the "synthetic" students
used final free modifiers in 5.6% more of their T-units than the
"analytic" students used in theirs. Again converted to percentages,
these ratios indicate that these 18 "synthetic" students wrote
final free modifiers in 1.4% more of their T-units than all "tutorial"
students wrote in theirs (see Table 4.19), and in 3.2% more of
their T-units than all "analytic" students wrote in their T-units
(see Table 4.25). However, the mean percentage of A_2B_2 posttest

T-units for the 18 "synthetic" students was almost identical to that calculated for all "synthetic" students (see Table 4.26).

An examination of the mean holistic scores for both groups of students on both sets of essays also, indicates some striking differences between the 18 "analytic-tutorial" and 18 "synthetic-tutorial" students. Table 5.29 and Table 5.30 show that on the A_1B_1 essays the "synthetic" students, on the average, increased their pretest scores by 0.89 of a point, or by 0.45 of a point more than did the "analytic" students. Although neither the average gain by the "analytic" students nor the average gain by the "synthetic" students reached statistical significance, the mean gain for the "synthetic" students exceeded the statistically significant gains of other groups examined in the present study. The 0.89 of a point gain, for example, exceeded by 0.41 the mean gain for all "analytic" students (see Table 4.25), by 0.65 that of all "tutorial" students (see Table 4.19), and by 0.35 the mean gain of all "synthetic" students (see Table 4.26). But while the mean gain in A_1B_1 essay quality for the "synthetic" students is somewhat impressive, their A_1B_1 posttest mean score is not nearly so. That score of 4.44 points is 0.23 of a point less than that recorded for all "synthetic" students (see Table 4.26), 0.34 less than the posttest mean of all "tutorial" students (see Table 4.19), 0.73 less than the mean of all "analytic" students' posttest mean, and 0.62 of a point less than the mean holistic score observed for the 18 "analytic" students in the present comparison.

Whereas the mean gain score on the A_1B_1 essays was larger for the "synthetic" students, the mean gain on the A_2B_2 holistic score

was larger for the "analytic" students. In fact, the "analytic"
students on the average improved by one full point on the A_2B_2
posttest, an average gain which is exactly twice as large as
that observed for the "synthetic" students. This average im-
provement in essay quality is 0.17 of a point larger than it was
for all "tutorial" students (see Table 4.19), 0.30 larger than the
one for all "analytic" students (see Table 4.25), and 0.22 larger
than the average gain observed for all "synthetic" students (see
Table 4.26). But the differences between the mean changes on the
A_2B_2 holistic score are not the only differences which were found
along this dimension. The A_2B_2 posttest mean holistic score for
the 18 "synthetic" students was 4.33; and for the 18 "synthetic"
students, it was 5.44. The difference between the two posttest
means is thus 1.11, indicating that at the end of the semester the
"analytic" students were writing argumentative essays having a
significantly higher quality than the essays of the "synthetic"
students. Not only did these 18 "analytic" students write sub-
stantially better posttest argumentative essays than did the 18
"synthetic" students but so too did at least three other groups
of E 306 students we examined. The 18 "synthetic" students wrote
posttest argumentative essays which were inferior in quality to
those produced by all "synthetic" students (see Table 4.26), by
all "tutorial" students (see Table 4.19), and by all "analytic"
students (see Table 4.25). These large differences were 0.58,
0.67, and 0.98, respectively.

To answer the question of whether either of the two curricula
taught in a "tutorial" setting had a significantly greater effect

on the posttest means of the 18 "analytic" and the 18 "synthetic"

students, we compared the posttest means of the two groups.   For

this comparison, we conducted a series of analyses of covariance,

using the pretest scores of each group as covariates in order to

accommodate any pretest differences between the two groups.   The

results of these analyses are reported in Table 5.31 and Table 5.32.

Insert Table 5.31 about here.

Insert Table 5.32 about here.

Table 5.31 indicates that when pretest differences are entered into

the analytic paradigm, neither the "synthetic-tutorial" course

nor the "analytic-tutorial" course is more effective than the other

in producing differences between the pretest and the posttest scores

for the A_1B_1 essays.   For the A_2B_2 posttest essays, however, the

analyses of covariance calculated two statistically significant

curricular effects and suggested a third.   As an examination of

the posttest means recorded in Table 5.32 reveals, the "synthetic"

curriculum taught tutorially produced average essay lengths that

were almost significantly larger than those produced by the "analytic"

curriculum.   The posttest differences in the use of final free modi-

fiers were, however, the result of statistically significant cur-

riculum effect.   As would be expected, given the attention to

sentence-level operations, the "synthetic" students used final free

is somewhat smaller than that observed for all "tutorial" students (see Table 4.23) and somewhat larger than that recorded for all "synthetic" students (see Table 4.30). The mean change for the present "analytic-tutorial" students, on the other hand, is 0.82 of a point larger than that of all "tutorial" students and 0.88 of a point larger than the one observed for all "analytic" students (see Table 4.29). For the mean total scores for the several groups the differences do not appear to be very large.

A noteworthy difference between the two groups in the present comparison appeared for the respective change scores recorded for the paragraph comprehension subtest of the McGraw-Hill Reading Test. Whereas the "synthetic-tutorial" students realized a mean positive change of 1.29 points—which was 0.51 of a point larger than that recorded for all 180 students (see Table 4.5)—the "analytic-tutorial" students regressed by 0.43 points. This negative change compares with a positive change of 0.78 of a point for all 180 students (see Table 4.5), 0.58 of a point for all "tutorial" students (see Table 4.23), and 0.88 of a point for all "analytic" students (see Table 4.29).

Analyses of covariance allowed us to determine whether either of the two curricula taught tutorially could be said to better produce change along these dimensions than the other. As Table 5.35 reveals, significant effects were found for neither of the

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Insert Table 5.35 about here.

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two curricula, in spite of the large differences observed. between certain of the objective test change scores recorded for the two groups.

5.3. The Five Derivative Comparisons: A Summary

Analyses of covariance conducted in connection with the five principal comparisons allowed us to focus more directly on the central questions posed by the present study. This question may be stated as follows: Is the regular E 306 course more or less effective than the alternative E 306 course? As was pointed out above, these two courses differed with respect to underlying rhetorical theory (an "analytic" or whole-to-part curriculum), instructional method ("conventional" classroom instruction in contrast to "tutorial," individualized instruction), and instructional media (textbooks in contrast to textbooks supplemented by interactive computer modules). In a direct comparison of these two E 306 options it was impossible to control or test for the instructional and curricular variables which distinguished the two E 306 options. However, a direct comparison--which controlled for the teacher variable and for the number of students on either side of the comparison--yielded some important results.

Analyses of the writing performances of the two groups of students on the narrative-descriptive essays that drew on personal experience indicate that the students in the "analytic" or regular E 306 course wrote posttest essays which were significantly better in quality than those written by the students in the "synthetic"

or alternative E 306 course. These analyses also indicated that the "analytic" or regular E 306 course effected significantly larger number of T-units with non-restrictive modifiers in the final position than did the alternative, "synthetic" E 306 course. So too with the percentage of total words in final un-bound sentence modifiers. A comparison of the posttest means for clause and T-unit length, however, revealed that neither course effected greater pretest-to-posttest changes along those dimensions of syntactic maturity than did the other.

As for the performances of the two groups of students on the argumentative essays, our direct comparison of the regular or "analytic" E 306 course and the alternative "synthetic" E 306 course indicates that neither course was more effective than the other in producing changes along the dimensions of mean clause length, mean percent of T-units with final free modifiers, mean per-cent of words in final modifiers, or mean quality score. Significant gains were observed along two dimensions. The regular "analytic" E 306 course produced longer essays than did the alternative E 306 course; and it produced posttest T-units which were, on the average, significantly longer than those produced by the alternative E 306 course.

No significant course effects were observed for the objective measures of writing-related skills. Both courses were equally ef-fective in producing changes on the three subtests and the total score of the McGraw-Hill Writing Test, on the paragraph compre-hension subtest of the McGraw-Hill Reading Test. Similarly, neither course effected any change in writing apprehension.

Our direct comparison of the two E 306 options could not control for the curriculum variable ("analytic" vs "synthetic" curriculum) or the instructional variables ("conventional" class-room instruction vs "tutorial" instruction and textbook instruction vs textbook instruction supplemented by computer-assisted instruction). In other comparisons, however, we did control for these variables, as well as the teacher variable and the number of students on either side of a given comparison. These other comparisons allow us to identify some of the most and some of the least salient features of the two E 306 options.

To determine whether either of the two curricula was more effective than the other, we compared the two curricula in two different ways. We compared the two curricula when both were offered in a "conventional" classroom setting and when both were offered in a "tutorial" setting. Along the eighteen dimensions we analyzed for a curriculum effect when the curriculum was taught in a "conventional" classroom setting, we found that the "analytic-conventional" courses were, with one exception, as ef-fective as the "synthetic conventional" course. Students in the "synthetic-conventional" courses wrote posttest essays on the ar-gumentative topics which were significantly longer than those of the students enrolled in the "analytic-conventional" courses. Our second comparison of the two curricula differed from the first in that both were offered in a "tutorial" setting rather than in a "conventional" classroom setting. Again we tested for the effects of the curricula on student performances along the 18 dimensions associated with the two types of essays and the objective measures of writing-related behaviors. Our analyses revealed that when

taught in a "tutorial" setting, the "synthetic" curriculum caused students to write argumentative posttest essays that included a significantly larger mean percent of T-units with final nonrestrictive modifiers. The analyses also revealed that these same students in their posttest argumentative essays placed a significantly larger percentage of total words in these final free modifiers. Along the remaining 14 dimensions, neither curriculum taught in à "tutorial" setting could be judged more effective than the other.

The three statistically significant course effects attributed to the "synthetic" curriculum when the instructional variables were controlled, however, need to be placed in a context. While the "synthetic-conventional" students wrote significantly longer posttest argumentative essays than the "analytic-conventional" students did, there is little evidence to suggest corresponding or complementary significant posttest differences for argumentative essay quality. Similarly, although the "synthetic-tutorial" curriculum produced statistically significant effects associated with final nonrestrictive modifiers, the "synthetic-tutorial" courses did not prove to be more effective than the "analytic-tutorial" courses in enhancing the overall quality of the posttest argumentative essays. Without corresponding gains in writing quality, such increases in quantitative measures may be of little importance.

In addition to testing for the effects of the curricula when the other major variables were rigorously controlled, we also tested for the effects of instructional method while controlling for the other major variables. This comparison involved four "analytic" curriculum classes, two taught in a "conventional" classroom setting and two taught in a "tutorial" setting. Our

analysis revealed that the "tutorial" method effected statistically significant posttest differences on the argumentative essays along the two dimensions focusing on the use of final nonrestrictive modifiers. Along the remaining 14 dimensions, no effects were found that could be attributed to the instructional method. Thus, along 14 of the sixteen dimensions both instructional methods appear equally effective in teaching the "analytic" curriculum.

The extent to which these more rigorously controlled comparisons shed light on our direct comparison of the two major E 306 options is open to question. Nevertheless, it is our opinion that these additional comparisons, together with the previously reported derivative comparisons, help to explain why the "analytic-conventional" E 306 option is in some ways more effective than the "synthetic-laboratory-tutorial" E 306 option. Our analyses of covariance did allow us to test systematically for the effects of curricula and instructional methods on the perfromances of E 306 students. We did not, however, systematically test for the effect of the computer-assisted instruction used as the "laboratory" component of the "synthetic-tutorial" E 306 option. We found that the "analytic-conventional" E 306 option produced five effects that were statistically significant, three on the posttest narrative-descriptive essays and two on the posttest argumentative essays. In all other respects the two principal E 306 options were found to be equally effective. When, however, the "computer-assisted" components of the "synthetic-tutorial" E 306 option was eliminated, the "synthetic" curriculum produced significantly longer posttest argumentative essays than did the "analytic" curriculum, and it

promoted significantly greater use of final free or nonrestrictive modifiers in the posttest argumentative essays. Furthermore, in both of the comparisons of the two curricula when the institutional method was rigidly controlled, the "synthetic" curriculum produced essays as high in quality, on the average, as those produced by the "analytic" curriculum, and on both types of posttest essays. In our direct comparison of the two E 306 options, we found that the "analytic" option produced better essays in the posttest "narrative-descriptive" essays that drew on personal experience; and in our comparison of the two instructional methods--the "conventional" classroom and the "tutorial"--we found that both produced posttest essays on both topics that were equal in quality. Therefore, we must conclude that with reference to the direct comparison of the two major E 306 options, the "computer-assisted" component --not the "synthetic" curriculum and not the "tutorial" method affected adverse the quality of writing on the posttest narrative-descriptive essays. This component did not, however, have a similar adverse effect on the quality of the posttest argumentative essays.

CHAPTER 6

THE INFLUENCE OF WRITING APPREHENSION ON

STUDENT PERFORMANCE IN F 306

In this chapter and the next chapter, we will examine factors
which influence writing performance. The present chapter focuses
upon how college freshmen feel about writing and how writing ap-
prehension affects what they write. From classical antiquity
onward teachers have observed that some individuals dislike writ-
ing and avoid situations where writing is required. Other in-
dividuals, in contrast, enjoy writing. They find writing a grati-
fying activity, even without the presence of external rewards.

6.1 Summary of Previous Research

Only recently have researchers examined how an individual's
attitude toward writing might affect what he or she writes and
how he or she reacts to situations associated with writing.
Daly and Miller (1975a) call this phenomenon writing apprehension.
They define writing apprehension as an individual's inclination
to approach or avoid situations which are perceived to require
writing accompanied by some amount of evaluation. Writing appre-
hension has been linked to several other factors, including those

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involving decisions concerning academic and career choices, per-
formance on tests of verbal intelligence, and competency in
writing. High writing apprehensives tend to choose academic and
career specialties which they perceive to require little writing.
Low writing apprehensives, on the other hand, tend to select oc-
cupations and majors which they believe to require considerable
writing (Daly & Shamo, 1976, 1977; Miller & Daly, 1975b). The
degree of writing apprehension has been shown to be associated
with lower scores on standardized tests of writing aptitude and
general verbal ability (Daly, 1978b; Daly & Miller, 1975b).
More important to the present study, individuals who are highly
apprehensive about writing produce essays which are evaluated
lower in quality than those written by low apprehensives (Daly,
1977; Richmond & Dickson, 1980).

6.2   E 306 Writers and Writing Apprehension

Because of the results of these and other studies of
writing apprehension, we decided to include the writing appre-
hension instrument as one of the measures in our study of E 306.
As we reported in Chapters 4 and 5, none of the instructional
and curricular components we analyzed for E 306 effected sig-
nificant change in the degree to which E 306 writers were appre-
hensive about writing. However, we felt that the writing
apprehension instrument measured an important component of students'
receptiveness to writing instruction. We examined this assumption
by testing four hypotheses: at the time of the pretest, high
writing apprehensives would write essays that (1) were shorter,

(2) were less elaborated syntactically, and (3) would be evaluated
by writing teachers lower in overall quality than essays written
by low apprehensives; and (4) high writing apprehensives would
score lower on standardized tests of writing ability, reading
comprehension, and general verbal ability than low apprehensives.

Method. The 167 students who completed the writing appre-
hension instrument at the time of the pretest were divided into
thirds on the basis of their scores on the instrument. We classified
55 students as high writing apprehensives, 51 as moderate appre-
hensives, and 55 as low apprehensives. We compared mean scores for
the high and low apprehensives on the A_1B_1 essay topics, the
expository topics drawing on personal experience, and the A_2B_2
topics, the persuasive topics, in an analysis of variance (ANOVA).
We included total length, four syntactic variables (words per
T-unit, words per clause, ratio of T-units with final nonrestrictive
modifiers, and ratio of total words in final nonrestrictive modifiers
--all used in analyses reported in Chapters 3, 4, and 5--and holistic
rating of quality. We also compared mean scores on standardized
tests of writing ability (McGraw-Hill Writing Test, English
Composition Test), of reading ability (McGraw-Hill Reading Test,
paragraph comprehension subtest; SATV-Reading Comprehension; and
SATV-Vocabulary) and general verbal ability (SAT Verbal) in an
analysis of variance. In addition, we attempted to determine which
variables are predictors of writing apprehension by placing all
dependent variables in a stepwise multiple regression analysis,
a statistical procedure which estimates an independent variable in
terms of a number of dependent variables.

Results. The results of the ANOVA of the A_1B_1 topics are reported in Table 6.1. As this table shows, low apprehensives significantly outperformed the high apprehensives on all essay measures at or beyond the .04 level of confidence.

Insert Table 6.1 about here.

Low apprehensives wrote papers which were, on the average, 83 words longer, more elaborate and varied in syntax, and higher in a subjective rating of overall quality.

The high and low apprehensives were not so clearly differentiated on the A_2B_2 topics. The results of this comparison are reported in Table 6.2. Table 6.2 shows that on the A_2B_2 essays the low

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Insert Table 6.2 about here.

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apprehensives again wrote, on the average, papers significantly longer than high apprehensives and used significantly more non-restrictive modifiers. However, the differences between the high and low writing apprehensives in mean words per T-unit, mean words per clause, and mean holistic score were not significant.

Scores on standardized tests of writing aptitude, reading comprehension, and general verbal ability also differentiated the two groups, as Table 6.3 illustrates.

Insert Table 6.3 about here.

Differences between the mean scores of high and low writing apprehensives on the English Composition Test were significant at the

.001 level of confidence, but the scores on all of the subtests of the McGraw-Hill Writing Test (not reported here) and the total scores were not significant. Low apprehensives also performed significantly better on the Test of Standard Written English. Tests of reading comprehension showed a similar pattern, with low apprehensives outperforming high apprehensives at or beyond the .03 level of confidence on the McGraw-Hill Reading Test, the SAT Vocabulary subtest, and the SAT-Verbal test.

All 167 students were considered in the stepwise multiple regression analysis to determine which variables predict writing apprehension. These results are reported in Table 6.4.

Insert Table 6.4 about here.

The best predictor of writing apprehension was the number of words per clause on the A_1B_1 set of essays, explaining over 11 percent of the variance in scores on the Writing Apprehension Test. The total number of words in the A_1B_1 essays accounts for another 6.7 percent, and the ratio of words in final nonrestrictive modifiers in the A_2B_2 topics explains another 3 percent. The McGraw-Hill Reading Test, the only standardized test that explains as much as one percent of the variance in apprehension scores, accounts for three percent more. Altogether, the 18 variables entered into the regression equation account for about 28 percent of the variance in writing apprehension scores, leaving about 72 percent of the variance unexplained.

Discussion. Our analyses of the performances of high and low writing apprehensives support and extend the findings

of others who have investigated writing apprehension. Writing apprehension again is associated with measures of general verbal abilities and writing performance. For the first time, writing apprehension has been linked to syntactic measures in written discourse.

Several findings are of particular interest. The fact that high writing apprehensives comparatively did much better on the A_2B_2 essay topics, the persuasive topics, suggests that these writers perform better on subjects not associated with the self. This interpretation is consistent with research that has associated writing apprehension inversely with general self-esteem (Daly, 1980). Topic variables thus seem important in assessing the writing abilities of high writing apprehensives.

The syntactic differences uncovered in this study for the first time point to a tendency of highly apprehensive writers to elaborate their statements less fully and to use the same syntactic constructions more frequently than low apprehensives. This may be attributable to generally lower verbal abilities as the standardized tests suggest, or it may in part be due to the tendency of these writers to "play it safe," using only words and structures they know how to spell and punctuate. Evidence exists that high writing apprehensives experienced negative teacher responses in their early writing attempts (Daly, 1978b; Harvley-Felder, 1978). Whatever the case, the multiple regression analysis shows syntactic character-istics much more closely related to writing apprehension than to over-all writing quality (see Chapter 7).

6.3 Conclusion

Writing apprehension has again been shown to be an important
dimension of writing performance, one which standardized tests
do not measure to any appreciable degree. These and other results
indicate that for college writing programs to be successful in
teaching all students, they must reduce the anxiety about writing
of highly apprehensive individuals. How this might be accomplished,
however, has yet to be even speculatively discussed. Certainly,
more research in the effects of instruction on writing apprehension
is needed.

CHAPTER 7

PREDICTORS OF WRITING QUALITY AND

COURSE GRADE IN E 306

In the preceding chapter we explored the relationship
between writing quality and writing apprehension, two of the
variables which we had measured for most of the 180 E 306
students used in the present study. In the present chapter,
we explore most of the other variables analyzed in the preceding
chapters to determine how much tney predict of the variance in
either the holistic scores or E 306 course grades.

7.1 Summary of Previous Research

In determining instructional emphases in the courses they
teach, many writing teachers are guided by what they perceive as
elements of writing assoicated with writing quality. As a result,
some teachers heavily emphasize, say, syntactic features as in
sentence combining, while others heavily emphasize, say, para-
graph development. However, apart from a large body of opinion
on the subject, there has been generated over the years very
little empirical evidence to indicate which particular variables
predict writing quality; and no studies, to our knowledge, have
attempted to identify systematically those variables which predict

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overall performance in a freshman writing course.

Although relatively few studies have systematically examined the relationship between features of written discourse and raters' judgments of overall quality, some important work has been done. For example, Diederich, French, and Carlton (1961), in an analysis of teachers' comments on student papers, found that such matters as mechanical correctness, handwriting, organization, and tone seemed to influence the overall judgment of quality. Diederich, French, and Carlton also indicated that essay length affected raters' judgments of overall qulaity. Several years later, Nold and Freedman (1977), using more sophisticated statistical procedures, found essay length to be an important predictor of quality judgments. Using a stepwise multiple regression analysis, Nold and Freedman also found that, in their pre- and posttest sample of two types of discourse written by 22 Stanford University freshmen, the percentage of words in final nonrestrictive modifiers predicted 12% of the variance in the holistic scores. They also found that certain types of verbs and verb forms predicted another 11% of the variance. In a recent study of narrative and descriptive writing of University of North Dakota freshman, Faigley (1979c) reported that the percentage of T-units with final free modifiers predicted 16% of the variance in the holistic scores assigned to the pretest and posttest essay of his sample population. Essay length was found to be the second most significant predictor, but it predicted only about 3% of the variance in holistic scores. In the Faigley study, a total of 22% of the variance in the summed

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holistic scores was predicted by the sums of the six variables
entered into the regression equation.

7.2 Predictors of Writing Quality in E 306

To determine how much of the variance in holistic scores
of the 720 E 306 essays (see Chapter 2) used in the present study
could be predicted by the five variables computed for each essay
set, we ran four stepwise multiple regression analyses. The
appropriate holistic scores were used as the dependent variable
in each analysis; and the independent variables in each analysis
were the four syntactic variables--mean T-unit length, mean
clause length, ratio of T-units with final nonrestrictive modi-
fiers to total T-units, and the ratio of words used in final
free modifiers to total words--and the variable for average essay
length. A stepwise multiple regression enters into the regres-
sion equation the independent variables in the order of their
predictive power. It then continues entering independent variables
into the equation until the researcher decides from the entering
F-ratio that the added variables are not significant predictors
of the dependent variable.

The first of the four regression analyses we conducted for
holistic scores focused on the relationship between the quality
scores assigned to be A_1B_1 posttest essays and the five indepen-
dent variables listed above. The results of this analysis appear
in Table 7.1. As Table 7.1 indicates, approximately 5% of the

Insert Table 7.1 about here.

variance in the holistic scores assigned to the A_1B_1 posttest essays is predicted by average essay length. Another 3% is predicted by the ratio to total words of words in final free modifiers. Collectively, all five variables predict less than 8 1/2% of the variance in holistic scores, leaving over 91% of the variance unexplained.

Table 7.2 presents a similar analysis, this one for the

Insert Table 7.2 about here.

holistic scores assigned to the A_2B_2 posttest essays. Of the five independent variables entered into the regression equation, only one--mean essay length--was found to predict more than 1% of the variance in the holistic scores. That variable predicted a little over 6.5% of the variance. The other two variables listed in Table 7.2 together predict less than 1 1/2% of the variance in holistic scores. All five variables entered into the equation predict collectively only slightly more than 8% of the variance, leaving over 91% of the variance unaccounted for.

In the third stepwise multiple regression, we used the summed holistic scores of the A_1B_1 and the A_2B_2 posttest essays as the dependent variable and the eight syntactic factors and the two essay-length factors as the independent variables. As Table 7.3 illustrates, the best predictor of the posttest

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Insert <u>Table 7.3</u> about here.

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holistic scores is the average number of words in the A_2B_2

posttest essays. That variable predicts nearly 8% of the var-

iance. The next best predictor--ratio of words in final nonre-

strictive modifiers in the A_1B_1 posttest essays--predicts an

additional 4.5% of the variance. The remaining eight factors

each predict less than 1% of the variance, and all ten indepen-

dent variables collectively predict approximately 14.3% of the

variance in the summed holistic scores of the A_1B_1 and the A_2B_2

posttest essays.

To conduct the fourth stepwise multiple regression analysis,

we summed the holistic scores for the pre- and posttest essays

written on both the A_1B_1 and the A_2B_2 topics. The resultant

summed holistic score--which was the sum of the four holistic

scores for each case--was used as the dependent variable in the

regression equation. For the independent variables, we summed

the four scores for the mean number of words, mean T-unit and

clause length, and the two ratios associated with final free

modifiers. The results of this analysis are reported in <u>Table

7.4</u>. As <u>Table 7.4</u> shows, essay length was again found to be the

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Insert <u>Table 7.4</u> about here.

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best predictor of writing quality. This factor predicted a little

more than 11% of the variance in the summed holistic scores. The

second best predictor--ratio of words in final nonrestrictive
modifiers--predicted only 2.3% of the variance; and words per
T-unit--the third best predictor--accounted for less than 1 1/2%
of the variance. Unlike the other two predictors, however, mean
T-unit length is negatively associated with writing quality, as
the correlation coefficient (r= -.0060) for the two variables
indicates. Collectively, all five independent variables explained
only 15.02% of the variance in the summed holistic scores of
the two pretest and two posttest essay sets.

7.3 Predictors of Course Grades in E 306

Of great interest to writing teachers and administrators
alike are measures that can predict success in a writing course.
Teachers and administrators are frequently told that standard-
ized tests such as SAT correlate highly with course grades in
writing classes, but seldom are they told that causality cannot
be inferred from correlation coefficients. That is to say,
writing teachers and administrators often assume that a causal
relationship exists between, say, SAT Verbal scores and semester
grades in a writing course. The extent to which such causal
relationships obtained for the 180 E 306 students used in the
present study is the subject of the present section.

To identify significant predictors of semester grades in
E 306, we ran a stepwise multiple regression analysis, using
final course grades in E 306 as the dependent variable. For this
analysis, we used as independent variables several objective

measures of writing-related skills. The objective measures of
writing-related skills used as independent variables were the
following: SAT Verbal, SAT Math, English Composition Text (ECT),
and the three subtests of the McGraw-Hill Writing Test--language
mechanics, sentence patterns, and paragraph patterns. (For an
exposition of the three McGraw-Hill subtests, see Chapter 4
above.) We also used as independent variables the A_1B_1 and the
A_2B_2 pretest holistic scores, plus the one essay-length index
and the four syntactic indices computed for both the A_1B_1 and the
A_2B_2 pretest essays. Although some of the data used to compute
the independent variables were collected several months prior
to the students' matriculation in E 306 and some were collected
at the very beginning of their E 306 study, none of the data
was collected after the students received instruction in a
college writing course.

Table 7.5 reports the results of this analysis for the four
most powerful predictors of E 306 course grade. As Table 7.5

Insert Table 7.5 about here.

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shows, the pretest holistic score on the A_1B_1 essays is the best
predictor of E 306 course grades, accounting for 5.8% of the
variance among the final grades reported on the grade sheets
at the end of the Fall Semester of 1978. The second best pre-
dictor--SAT Verbal--explained another 3.3% of the variance; and
the ratio of T-units with final nonrestrictive modifiers in the

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A_2B_2 pretest essay accounted for another 1.3%. The fourth most powerful predictor--the ratio of words in final free modifiers in the A_1B_1 pretest essays--explained slightly less than 1% of the variance. It should be noted, however, that a negative correlation coefficient (r = -.0286) was computed for the relationship between course grade and ratio of words in final nonrestrictive modifiers. The remaining twelve independent variables combined to explain only an additional 4.9% of the variance in E 306 semester grades. Thus altogether the 17 independent variables entered stepwise into the regression equation explained only 16.24% of the variance in course grades, leaving 83.76% unexplained.

7.4 Discussion of the Results

The results of the analyses presented in this chapter seem to contradict in some ways the findings reported in previous studies. By comparison to the percentage of variability in holistic scores reported by Nold and Freedman (1977) and by Faigley (1979c), the present percentages seem quite low. Nold and Freedman reported that a little over 31% of the variance in holistic scores was explained by two independent variables. One of these resembled the essay-length variable used in the present study. The other was a simple conversion to percentage of the present study's ratio of words in final free modifiers. In the Nold and Freedman study, the latter variable was found to predict 11.6% of the variance in holistic scores. In the

present study, the most that that variable predicted was about 4.5% of the variance in the holistic scores assigned to all posttest essays. The Faigley study, like the Nold and Freedman study, found one index of final nonrestrictive modifiers to be a powerful predictor of holistic score. Faigley's index-- the percentage of T-units with final free modifiers--is simply a conversion of the ratio used in the present study. While Faigley reported that 16% of the variance in holistic scores was explained by this index, the largest percentage of the variance in holistic scores found in the present study for that index was .65% on the A_2B_2 essays. As a predictor of $E_.306$ course grade, this variable explained only about 1.3% of the variance. The other index of free-modifier use predicted even less of the variance--about 0.9%--and that variable correlated negatively with course grade.

Attempting to reconcile these different percentages explained by these variables is no easy matter. While we cannot identify precisely the reasons for these discrepancies, we can at least speculate about some of them. In the Faigley study, the regression analysis used the summed holistic scores awarded the pretest and the posttest essays. Of the students in the Faigley study, approximately 51% underwent intensive instruction in the principles and practice of Christensen's generative rhetoric. Thus fully 25% of the essays making up the sample on which the regression analysis was run were written by writers who had been taught systematically to add free modifiers to the base clauses of the setnences they wrote. In contrast, the "synthetic" students

in the present study, students also taught a Christensen-based
curriculum, numbered only 54, accounting for about 30% of the
students used in the present study. Thus in the present study,
Christensen-influenced posttest essays accounted for only about
15% of the total essays. This relatively smaller contribution
in the present study of the "synthetic" essays to the total
essays probably influenced the outcome of the regression analysis.

Another probable reason for the discrepancies in the predic-
tive power of the two indices associated with final nonrestric-
tive modifiers can be explained with reference to holistic change
scores of the "analytic" students in the present study and the
holistic change scores of the "control" students in the Faigley
study. In the Faigley study, the "control" students were
taught a curriculum similar, although certainly not identical,
to the "analytic" curriculum in the present study. In the
Faigley study, the "control" students realized an average hol-
istic change of 0.18 of a point on a 1-to-6 scale, gains which
were not statistically significant. In constrast, the "analytic"
students in the present sutdy realized statistically significant
positive change in holistic score on both kinds of writing inves-
tigated in the present study. This difference between the two
groups of "analytic/control" students indicates that in the
Faigley regression analysis, the essays which were rated the
highest were those of students who had been taught to use final
nonrestrictive modifiers. In the present study, on the other hand,
both the "synthetic" and the "analytic" students realized signi-
ficant positive changes in holistic scores, thus insuring that

the regression analyses would have been influenced both by
students taught to use final nonrestrictive modifiers and by
students who had not been taught to use final nonrestrctive
modifiers, but had nevertheless improved the overall quality
of their writing.

Another possible way to account for the differences is with
reference to the training procedures used in holistic evalua-
tions. In each of the three studies reviewed here, the raters
were trained with essays believed representative of the essays
to be rated in the respective holistic sessions. That is to
say, the criteria or cues which the respective groups of raters
used to judge the essays were always made relative to the essays
of the population being judged. Unless we are prepared to
believe--without the benefit of any supportive evidence to that
effect--that the raters in each of the three studies were utili-
zing the same set of judgmental cues and weighting those cues
similarly in their judgments of writing quality, we have to
assume that the judgments of writing quality were made differently
in each of the three studies. If this assumption is a valid one,
then the predictive power of a given variable should vary from
one study to another. And it appears to do so.

Even if the results of the three studies with reference to
predictors of writing quality are not strictly comparable, the
present study does in some sense confirm the validity of using
essay-length indices and indices of free-modifier use in such
multiple regression analyses. But perhaps more importantly,
it squarely points to the need for developing rating procedures

which are reliable across different studies and different populations. Together, the three studies we have reviewed here indicate the need to use a variety of new variables to determine the nature of writing quality more precisely. Our own study in Chapter 3 of the differences between high and low quality E 306 essays suggests some such indices to us. For example, some measure of cognitive egocentricism--such as the use of first- and second-person pronouns--seems to be a promising index for certain types of writing. The frequencies of error types seems to be another. Although extremely time-consuming, analyses of cohesion would probably yield variables capable of predicting a high percentage of the variance in holistic scores. The category of lexical cohesion seems particularly promising in this regard because it provides some measure of the extent to which writers are able to extend the semantic domains of concepts and ideas introduced in a piece of writing.

Our regression analysis to predict, on the basis of pre-course data, the final course grades in E 306 also points to some interesting findings. Most importantly, our analysis shows that for the sample population used in the present study, several of the "standardized" test measures are totally ineffective in predicting success in a writing course. Of the five such measures we examined--SAT Verbal, SAT Math, ECT, and the McGraw-Hill Writing Test--only the SAT Verbal proved powerful enough to predict a significant percentage of the variability in course grades. And that variable predicted only a little more than 3% of that variability. This finding suggests that

a good deal goes into the computation of semester grades which
is not measured by the SAT Verbal. Similarly, our analysis
indicates that with respect to writing quality either (1) compo-
sition teachers assign grades to essays differently than holistic
raters do, or (2) writing quality does not have a significant
impact on course grades. We suspect that the former is the
proper explanation. This suspicion is grounded on the differ-
ences discussed previously in some detail in Chapter 2. It seems
to us that teachers assign essay grades and course grades based
to some extent on the relative performances of the group of
students in the particular class. "Class" populaticns are,
in contrast, irrelevant in holistic evaluations. It also seems
to us that composition teachers often grade student writing
according to different sets of criteria established for different
writing assignments, perhaps emphasizing or weighting, say,
mechanics more heavily on one assignment than another. Another
major difference is that different criteria obtain for different
types of writing. In composition classes themselves, students
seldom write two comparable essays during the semester. Each
assignment probably differs from the preceding and the following
one with respect to mode, purpose, audience, or subject matter.
Perhaps all assignments differ along four dimensions or several
combinations of dimensions. Differing essays are and must be
graded differentially.

At any rate, the present chapter suggests the need to
identify and define variables which can predict performance in
freshman writing classes better than the variables used in the

present study. Only when better predictors of course achieve-
ment are found can directors of freshman composition programs
have confidence in their placement procedures.

CHAPTER 8

THE PRESENT STUDY IN THE LARGER CONTEXT

The present study was undertaken for the specific purpose of comparing the relative effectiveness of two distinct freshman composition courses at the University of Texas. In one sense, then, both the design of the research and the results of that research are "local" in nature. However, the present study shares a larger context as well, for it addresses some major issues in writing program evaluation and in curricular and instructional design, issues which concern both the University of Texas in particular and other universities and colleges in general. The present chapter focuses on the local and non-local contexts of the research reported in the previous chapters.

8.1 The Larger Context of the Present Study

To place the present study in its larger context is to offer immediately a number of caveats, not the least of which concerns the state of writing program evaluation itself. Although educational researchers (e.g., Braddock, Lloyd-Jones, and Schoer, 1963; Gage, 1973; Mellon, 1975; and Larson, 1979) generally emphasize the importance of writing program evaluation, Larson (1979) contends that the evaluation of writing, of the teaching of writing, and of writing programs is, for the most part, "an art not yet born." Indeed, at the present time, the profession lacks not only common procedures for evaluating

writing programs and courses but an adequate theoretical
framework for developing such procedures as well (see
Kinneavy, Daly, Faigley, and Witte, 1980). Difficulties
in defining the characteristics of effective written dis-
course and in identifying the salient features of composi-
tion courses have kept knowledge of how to evaluate writing
programs and courses at a rudimentary and impressionistic
level. No one has yet articulated the shape such evalua-
tions should take or the steps required to implement them.
With no generally accepted and few widely applied or appli-
cable procedures for evaluating writing programs, the larger
context of the present study must remain somewhat elusive.

Within this elusive larger context, previous evaluation
research has called attention to two related questions: Does
college writing instruction positively affect the development
of writing abilities? and Is one type of composition instruc-
tion more effective than another in teaching composition
skills?

The University of Northern Iowa Study. Most studies
have addressed both questions simultaneously, but one study
focused exclusively on the first question. That study, con-
ducted at the University of Northern Iowa (Jewell et al.,
1969), paired 2,080 freshmen enrolled at five different uni-
versities in the fall of 1964. The paired students were
matched on the basis of sex, writing ability, and ACT scores,
with one member of each pair taking courses in writing and

in other academic subjects and one member taking courses in
other subjects only.

Jewell reports that three tests--English Expression
(COOP), College Entrance Examination Board English Compo-
sition Test (CEEB), and a theme--were administered to the
students in the study at four different times--once at the
beginning of the college career and once at the end of the
first, second, and fourth semesters. The analyses of the
data indicated that at the end of the first two semesters
the students undergoing instructional treatments in composi-
tion outperformed their paired counterparts. However, by the
end of the fourth semester, students who had received no for-
mal instruction in composition performed as well as those
students who had received such instruction as freshmen. Jewell
thus concluded that freshman composition teaches writing skills
and behaviors that develop naturally, but at a later date.
In one sense, the Jewell study would suggest that the compo-
sition instruction at the freshman level is of limited value.
However, the assumption underlying the present study is that
if freshman composition can accelerate writing development,
students who have undergone composition instruction will
benefit substantially during their early semesters in college
from having received that instruction.

Other studies have focused principally on the second
question: Is a particular type of freshman composition in-
struction more efficacious than another? Like the present
study, those studies have assumed that writing instruction

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does benefit students. Many such studies have been conducted in recent years, and some are more important than others. Here we call attention to three we consider the most significant, even though all have certain design problems which render their finding inconclusive.

The University of California at San Diego Study. Among those studies is one recently completed at the University of California at San Diego (Wesling et al., 1978). The subjects used in that study were 175 freshmen unevenly distributed within four colleges within the university. Each of the four groups—which ranged in size from 35 to 50 students—produced three essays which were submitted to holistic evaluation by three independent raters. Each of the four groups had received instruction in composition, but apparently that instruction differed in important ways for each group. All groups are reported to have significantly increased their average holistic scores from the first to second themes and from the first to the third themes. Certain of the students also took the English Achievement Test (EAT) at two different times, once prior to admission and once after completing a course in college writing. The pretest-posttest use of the English Achievement Test was adopted in order to determine whether writing instruction in the four colleges "led to improvement in the editing component of writing" (p. 21). The gain scores on the English Achievement Test for none of the four college groups were statistically significant. Although the San Diego study is shot through with problems in

research design (e.g., a lack of control over discourse variables such as mode and purpose in the three writing samples, the administration of the English Achievement Test under different conditions, and a lack of control over the subject matter variable in the essays which the students in the different colleges produced), the study does seem to suggest that writing instruction does have a positive impact on the writing performances of college freshmen. Two of the four college programs evaluated depended heavily on readings, one on readings from the humanities and one on readings from the social sciences, while the other two colleges appeared to offer composition instruction more focused on the actual essays the students produced. Yet all four groups of students apparently realized statistically significant improvement in their abilities to write essays of the kinds they were asked to write.

The Miami University Study. Another important study is the widely publicized and recently completed one at Miami University (Daiker, Kerek, and Morenberg, 1978; Morenberg, Daiker, and Kerek, 1978). This study, which is less complex in nature than either the Northern Iowa or the San Diego study, is an experimental study that attempts to determine the relative effectiveness of a "sentence-combining curriculum" in comparison to a composition course "traditional at Miami and many other universities." In the Miami University

study, two groups of beginning college freshmen were formed.
One was called a "control" group and one was called an
"experimental" group. The former group was exposed to in-
struction based on McCrimmon's Writing with a Purpose supple-
mented by readings from an anthology of essays. The second
group, the "experimental" group, was given instruction based
on the sentence-combining exercises contained in Strong's
Sentence Combining: A Composing Book. Both groups of students
thus underwent an instructional treatment of some kind, thereby
making the investigators' distinction between a "control" group
and an "experimental" group a questionable distinction at best.

Although the reports of the Miami University sentence-
combining experiment suggest the contrary, the instructional
treatments offered the two groups differed along several in-
structional and curricular dimensions other than the sentence-
combining exercises the "experimental" group completed. As
Kinneavy (1979) and Mellon (1979) have pointed out, the sentence-
combining exercises themselves were cast as whole-discourse
problems, thereby teaching the "experimental" students rhetorical
principles that may or may not have been taught the "control"
group. Neither is there any indication that the students in the
two groups were taught to write discourse similar with respect
to aim or purpose and mode (on the distinction between aims and
modes in written discourse, see Kinneavy, 1971; Kinneavy, Campbell,
and Cope, 1976a and 1976b; and D'Angelo, 1980). Indeed, even the
most cursory review of Strong's Sentence Combining, the text used

in the "experimental" classes, reveals that narration and description are the two modes of discourse most frequently represented in the sentence-combining exercises, and that the purpose or aim of most of the exercises is to inform. In contrast, a "traditional" composition course would teach other modes as well as narration and description and would probably teach students to write effective persuasive, argumentative, and expressive discourse as well as informative discourse. Indeed, if the "control" classes in the Miami University study were taught the McCrimmon text in its entirety, they should have been taught to write in several different modes and for a variety of purposes.

The reports of the Miami sentence-combining experiment are silent on a number of other matters also. The writing topics used probably to elicit the pre- and posttest writing samples by which distinctions between the two groups were made called on the students to produce narrative and descriptive writing that drew heavily on personal experience, exactly the kinds of writing the sentence-combining students were taught to write throughout the semester. But was it the type of writing the "control" students undergoing "traditional" writing instruction were taught to write? We cannot tell from the published reports of that study. Neither do the Miami investigators indicate whether the students in the two groups wrote an equivalent, or even comparable, number of words during the semester, although the authors do report that both groups wrote

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the same number of essays at the same points during the
semester. Yet the "experimental" or sentence-combining
group combined sentences in preparation for or in connec-
tion with virtually every class meeting. They thus wrote
on a much more regular basis than did the students in the
"control" or "traditional" writing cours..

The larger gains for the "experimental" students along
the dimensions of holistic score and syntactic fluency also
raise a series of questions. Were these larger gains in
syntactic complexity and writing quality the direct result
of sentence-combining practice? Were they the result of class
discussions of students' solutions to sentence-combining
problems? Were they the result of the inductive teaching of
rhetorical principles? Were they the result of the great
amount of writing that the sentence-combining students did?
Were they the result of the classes' analyses of students'
solutions to sentence-combining problems? Or were they the
result of any possible combination of these uncontrolled
variables in the experiment? In point of fact, it is impos-
sible to tell from the accounts of this research exactly why
the students taught sentence combining wrote better essays
that were more syntactically complex than their counterpart·
in the "control" classes.

The University of North Dakota Study. Comparable to the
Miami sentence-combining study is a study recently completed
at the University of North Dakota (Faigley, 1979b, 1979c). It

2(s1)

is comparable to the Miami study in at least two respects:
first, it tested the effectiveness of a sentence-based
approach to teaching composition against a "traditional" ap-
proach; second, it utilized a research design almost identical
to the one used in the Miami study. However, it differs from
the Miami study in important ways as well. First, it attempted
to answer more questions than did the Miami study. Second,
it controlled more rigorously some of the important curricular
and instructional variables. Third, students in the "experi-
mental" classes in the North Dakota study were taught generative
rhetoric (see Christensen, 1967, for the major theoretical
statement).

In contrast to sentence-combining--which is only an in-
structional method--"generative rhetoric" conflates instruc-
tional and curricular concerns. From an instructional point of
view, generative rhetoric, like sentence combining, teaches
students to write sentences which are syntactically more com-
plex than the ones they customarily write. Both instructional
methods encourage students to embed kernel sentences in inde-
pendent clauses, to add subordinate elements to those clauses.
Such embeddings allow writers to deliver more content in fewer
words, reducing some independent clauses to phrases and others
to subordinate clause status. The result of such training and
practice is usually the production of sentences significantly
longer than those the students were writing before they under-
went the instructional treatment, whether sentence combining

or generative rhetoric. While the addition of content to
independent clauses is one of the principal goals of both
sentence combining and generative rhetoric, there are other
important differences between the two. Whereas sentence-
combining exercises supply all of the content the students
include in the derived sentences they write, instructional
materials based on generative rhetoric frequently supply the
student only the base clause for an extended sentence. The
student subsequently adds his or her own content to the base
clause.

Sentence combining and generative rhetoric also differ
with respect to curricular concerns, what might be referred
to as the "content" of a composition course. Sentence com-
bining has no content per se, whereas generative rhetoric
posits as content certain semantic principles which operate
within discourse units, whether sentences or extended units
of discourse such as paragraphs or essays (on this matter,
see Chapters 2 and 3 above). A generative rhetoric curricu-
lum teaches students to employ in the discourse they write
specific semantic relationships or structures. Sentence com-
bining, on the other hand, makes no assumptions about the
nature of derived texts, whether sentences or larger units.
Sentence combining refers simply to the act of combining
kernel sentences to form larger derived sentences. It es-
pouses no particular rhetorical theory, although exercises

may be designed to teach certain rhetorical principles

(on this matter, see Harris and Witte, in press). In con-

trast, the only theory that underlies sentence combining is

a pedagogical one.

The Miami sentence-combining study speaks of sentence

combining as though it were a curriculum, i.e., as though

it offered a content as well as an instructional method. As

a result, that study failed to control adequately either the

major instructional or the major curricular variables. The

North Dakota study of generative rhetoric, on the other hand,

recognized the presence of both curricular and instructional

variables in generative rhetoric; but it contained certain

inherent limitations. The most important of these was the

fact that the freshman English program at North Dakota was

divided according to the traditional four modes. Narration

and description were treated in the first semester and expo-

sition and argumentation during the second semester. The

study ended after the first semester; thus students were taught

only narration and description. Narrative writing samples

were collected. A follow-up study examining argumentative

writing would have been desirable; however, the results of such

a study could not be conclusive because the students were ex-

posed to different instruction during the second semester. The

North Dakota study failed to answer the criticisms of Johnson

(1969), Tibbetts (1970), and Winterowd (1975) that generative

rhetoric is of little use for teaching argumentation and exposition. Neither the Miami University nor the North Dakota study tested the effect of sentence-skills instruction on argumentative writing.

The North Dakota study examined the influence of generative rhetoric on specific syntactic structures as well as on the gross indices of syntactic complexity used in the Miami study and on writing quality. As in the Miami study, differences between the two groups' performances on a single writing sample were examined in detail. As the Miami study found statistically significant differences favoring the "experimental" classes at the end of the semester, so too did the North Dakota study. In addition to the "experimental" classes' larger gains in syntactic complexity and writing quality, students taught generative rhetoric wrote a higher percentage of their T-units with final nonrestrictive modifiers than did the "control" classes.

Although the San Diego and the Northern Iowa study both suggest the efficacy of "traditional" writing instruction at the college freshman level, they do so without the benefit of an adequate research design and without the visibility of a "gimmick." Using somewhat stronger research designs which controlled for a larger number of variables and offering a "gimmick" for teaching clearly focused writing courses, both the Miami study and the North Dakota study report findings and analyses which strongly suggest that "traditional" freshman

writing courses (and <u>traditional</u> always seems to refer to courses not based on a "sentence-skills" approach) are inferior to courses based on sentence combining or generative rhetoric. That "traditional" courses in freshman composition should be rather poorly investigated--as in the San Diego study--or that they should be shown to be inferior to other types of freshman composition courses--as in the Miami University study and the North Dakota study--provides the larger context for the present study. In contrast to the Miami study and the North Dakota study, the present study compared two well-designed (and "well-designed" is an important construct generally ignored in previous research on "traditional" writing courses) and clearly focused freshman writing--one a "traditional" freshman writing course and the other a generative rhetorical course. The present study is thus distinguished from earlier published comparisons of "traditional" freshman writing courses with other courses because it controlled systematically for several curricular <u>and</u> instructional variables that were not controlled in previous research studies. The present study is thus far more notable for its research design and its control of major variables than any study published to date. For these reasons, the present study not only adds significantly to our knowledge of composition curricula and instructional methodologies, but it also serves as a model which can be used to guide future composition research, whether that research focuses on testing "experimental" approaches to the teaching of freshman writing or whether it

focuses on comparative evaluations of extant approaches.

8.2 Summary of the Major Findings of the Present Study

The more rigorous control over major instructional and
curricular variables in the present study allowed us to address
with some confidence our major question. That question focused
on the relative effectiveness of two distinctly different fresh-
man writing courses. To investigate that question adequately,
we could not, as several previous studies of college composition
courses have done, assume that the two courses differed along
one dimension only. As we pointed out in Chapter 2 above, the
two courses in the present comparison differed with respect to
underlying rhetorical theory and method of instruction. As a
result, several curricular and instructional variables had to
be controlled in order to determine whether either of the two
courses was more effective than the other. Like the Miami Uni-
versity study, then, the present study compared two entirely
different freshman writing courses. Unlike the Miami University
study, however, the present study speaks of neither "control"
groups nor "experimental" groups, treating both as though they
were undergoing some type of "experimental" treatment, as indeed
they were.

The present study also investigated the performances of
the student groups more systematically than have previous evalu-
ation studies. In the present study, for example, students in
both courses did not write just one piece of discourse on which

their performances were compared on the basis of two samples
of extended written discourse mode and aim. As we noted in
Chapter 2, one of the discourse samples was largely narra-
tive and descriptive with respect to mode, drew heavily on
the students' personal experiences, and was designed to be
informative. The other discourse sample was argumentative in
nature, comparable to what Kinneavy calls "scientific dis-
course," in which a writer attempts to prove a thesis. By
eliciting two distinctively different types of written dis-
course from the students in the present study, we believed
that we would be able to compare student writing on the basis
of written products which are usually taught and written in
"traditional" writing courses and which were specifically
called for in the course syllabus for the Freshman English
Program at the University of Texas.

In addition to comparing student performances on the
basis of two writing samples representing different types of
extended discourse, we also compared student performances
on objective measures of writing-related skills or behaviors.
Although these skills and behaviors were considered but ad-
juncts to actual writing practice, we believed that they
would provide additional indicators of the impact of writing
instruction. Specifically, we sought to measure the effects
of writing instruction in five areas other than actual writing
performance. First, we sought to determine the effects of
writing instruction on the recognition of mechanical errors

in punctuation, capitalization, and grammar. Second, we sought to measure the effects of writing instruction on the student's ability to recognize sentence patterns of various types. Third, we sought to measure how well a student could organize a given content in to a multiple-sentence paragraph and how well the student could recognize the appropriate and inappropriate use of transitions. Fourth, we sought to determine whether writing instruction had any effect on the student's ability to read and comprehend prose texts comparable to those he or she would encounter in textbooks for other college courses. Fifth, we tried to determine whether instruction in writing significantly increased or decreased the amount of anxiety or apprehension students experienced when confronted with writing tasks. Together with the holistic evaluation scores and the syntactic analyses of the writing samples, these five measures of writing-related skills and abilities constitute the multidimensional nature of the present study. Thus unlike most previous research in freshman writing, the present study compares the effectiveness of freshman writing courses not along one or two dimensions but along several dimensions of writing performance, writing-related skills, and the attitude toward writing.

It is neither possible nor desirable to summarize here all of the results reported in the previous chapters, but it is necessary to indicate those findings that we believe to be the most significant, significant both in terms of the larger con-

text of composition research and in terms of the needs of
the Freshman English Program at the University of Texas.

Among the most important results of the present study
are the following ones. First, the present study shows that
a "synthetic," sentence-based course in freshman writing can
be used to teach argumentative discourse effectively--some-
thing no previous research in composition has indicated it
could do. The "synthetic" curriculum in the present study was
able to teach its students to write argumentative essays while
requiring those students to write substantially fewer whole
essays during the course of the semester than did the "analytic"
curriculum in teaching students to write argumentative essays
may be attributable to the greater development of certain in-
vention skills among the students enrolled in that curriculum.

Second, the present study shows that both the "analytic"
and the "synthetic" curricula can be used effectively in both
conventional "classroom" and "tutorial" settings, another
matter not addressed in previous research in freshman composi-
tion. Up to now, studies have assumed that either instructional
or curricular variables were being investigated, but not both.

Third, the present study strongly suggests that well-
designed and clearly focused freshman writing courses can be
equally effective in producing positive change in writing per-
formance and in objectively measured skills and abilities.
This seems to be true regardless of whether the courses are
based on a "synthetic" or an "analytic" curriculum and whether

they are taught in a conventional "classroom" setting on in
a "tutorial" setting. This finding is particularly important
because it calls into question the findings of several recent-
ly published studies reporting the greater effectiveness of
"sentence-based" approaches as compared to "traditional" ap-
proaches to teaching freshman writing.

Fourth, neither the two curricula nor the instructional
methods examined in the present study either reduced or in-
creased significantly the amount of apprehension students feel
when they approach writing tasks. Yet, as reported in Chapter 6,
writing apprehension does appear to influence the way students
write and the way they perform on objective measures of writing-
related skills. This important dimension in the teaching of
freshman writing has never before been systematically investi-
gated with reference to so many curricular and instructional
variables.

Fifth, the results of paired T-tests of gain scores in-
dicate that students in virtually all the classes studied rea-
lized statistically significant improvement in not only overall
writing quality as measured by holistic scores on two different
measures of writing performance, but they also realized signi-
ficant gains in their command of the conventions of Standard
Written English as measured by the McGraw-Hill Writing Test.
Rarely have writing-related skills been considered in evalua-
tions of writing curricula and instructional methods.

A sixth major finding of the present study is that virtu-
ally all of the "analytic-conventional" classes realized statis-

tically significant improvement in reading comprehension, a finding which no other major study of freshman composition courses has been able to show. Most recent attempts to link improvement in reading comprehension with writing instruction have focused on the "sentence-skills" approach (e.g., Morenberg, Daiker, & Kerek, 1978). Research in comprehension, on the other hand, has largely abandoned sentence-level approaches and now considers the influence of "top-level" structures, structures that organize an entire piece of discourse (e.g., Kintch & van Dijk, 1978; Meyer, 1975; Meyer & Freedle, 1979). Recent comprehension research supports the assumption that the analytic curriculum, with its emphasis on the structure of whole pieces of discourse, was in part responsible for the reading gains.

Seventh, the analysis of raters' judgments of overall quality shows that internal syntactic indices do not correlate with writing quality. Nold and Freedman (1977) and Faigley (1979b) had previously found Hunt's paradigm of syntactic maturity to be of very little value in predicting raters' judgments of quality. These two studies, however, did find the ratio of T-units with final nonrestrictive modifiers to be a weak influence on raters' judgments (about 16% in the Faigley study), but an influence nonetheless. The present study found final nonrestrictive modifiers to be of no more value than Hunt's indices. In light of these findings, the value of com-

puting syntactic indices of any type in writing evaluation studies is questionable.

8.3   The Limitations of the Present Study

Although the present study was designed with a greater awareness of the many curricular and instructional variables which enter into the comparative evaluation of freshman writing courses than most previous studies, the present study is itself not without its limitations. Principal among the limitations is the size of the sample chosen from each of the twenty E-306 classes studied. In the case of all comparisons, whether "principal" or "derivative," reported in Chapter 4 and Chapter 5, the data from at least two classes were pooled, thus creating several comparisons in which an "n" of only 18 prevailed on one or both sides of the comparisons. We believe that such a small "n" may have precluded finding a larger number of significant effects for either instructional or curricular variables. Another major limitation of the present study is that the "synthetic-tutorial" classes wrote considerably less than did the students enrolled in other classes. This feature allowed the teachers of the "synthetic-tutorial" classes to spend a great deal of time guiding students in careful revisions of the essays they did write. In short, for a given essay the students in the "synthetic-tutorial" classes devoted more "time on task" to a particular writing assignment during the regular semester, while the students in the other

classes--students who wrote a larger number of essays during
the semester--spent considerably less time on any given
assignment. This difference in instructional methodology
represents a major uncontrolled variable in the present
study, even though our results suggest that the instructional
methodology employed in the "synthetic-tutorial" classes pro-
vides a suitable alternative for teaching composition. Another
weakness is the failure of the present study to address either
the question of teacher effectiveness or the question of stu-
dent attitudes toward the study of writing in the various in-
structional settings investigated. Teacher evaluation data
were collected from the students in the present study. These
data were based on student responses to teacher effectiveness
instruments provided by the University of Texas, but the ques-
tions asked were of such a general nature that they did not
distinguish among teachers teaching different curricula or
using different instructional methods. According to these
data, each instructional method and each curricula was as
effective as any other, was as liked as any other. Unless
teacher effectiveness instruments can distinguish among teach-
ers on the basis of instructional behaviors and techniques,
they are of little use in comparative evaluations of the kind
reported in the present study. A final major limitation of
the present study stems from what we perceive as an over-
zealous control of the teacher variable in the present study.
As we pointed out in Chapter 2 when we introduced the design

of the five principal comparisons, a single teacher always
taught two classes in any given comparison, with one class
being on one side of the comparison and the other class
being on the other side of the comparison. This control
was thought initially to be a strength, but we suspect that
in some cases, the unsuitability of a given teacher for a
given composition curriculum or a given instructional method
may have resulted in findings less reliable than we would
have hoped. For example, in the comparison of the "synthetic-
conventional" classes with the "analytic-conventional" classes,
we strongly suspect that one of the two teachers was more
comfortable with the "synthetic" curriculum while the other
was more comfortable with the "analytic" curriculum. Both,
however, were required by our research design to teach both
curricula. The effect of this design demand was that the
less-than-desirable performances of the two teachers, each in
teaching a different curriculum, cancelled out the good per-
formances they registered in teaching the curricula they were
most comfortable in teaching.

In spite of these limitations, the present study still
stands as perhaps the most carefully designed and carefully
conducted comparative evaluation of two freshman writing
courses that has even been completed. At the same time, it
demonstrates that a great deal more work must be done before
the profession at large can take much confidence in studies
such as this one. Although the present study does much to erect

an adequate theoretical framework for conducting comparative
evaluations of college writing courses, that framework re-
quires a great deal more thought than it has to date been
given, either in the present study or in other studies. Among
the other areas which need to be accommodated in such a frame-
work are guidelines for assessing the goals of college writing
programs in light of the demands made on students in other
college courses and in light of the demands made on writers
in the "real" world beyond the walls of the university or
college. Such a framework should also better accommodate
writing as a performative act than the present study does.
Unfortunately, the present study, like all of its predecessors,
addressed only the products the students produced, ignoring
almost totally the acts which led to those products. It is
incorrect to assume that if a curriculum does not immediately
effect change in the products the students write, it is an
inadequate curriculum. It is more realistic to assume that at
least some of the effects may not, in fact, become apparent in
the products students write until some months--perhaps even
years--have passed after the student completed the composition
course. Skill in using the written language develops slowly,
and that fact must always be seen as a caveat in any study
reporting significant or non-significant changes in the pro-
ducts student writers produce in connection with a given in-
structional treatment.

8.4 Implications for Teaching and Research

Any large and comprehensive study is bound to have
something to say both to teachers of college freshmen and
to those who are principally interested in addressing
through empirical or theoretical research the ways that
writing skills can best be learned and taught. The present
study is, we believe, no exception.

Among the implications of the present study for the
teaching of freshman composition are the following. First,
the present study suggests that teachers may confidently
use the generative rhetorical paradigm to teach argumenta-
tive writing to college freshmen. Indeed, as Harris and
Witte (in press) point out, the potential of sentence-
based approaches to freshman composition has not been realized;
and the present study strongly suggests that "synthetic,"
sentence-based curricula can be used successfully to provide
the instruction in rhetorical principles that college fresh-
men need to learn in order to write effectively regardless of
discourse type.

The important issues are what specific rhetorical prin-
ciples ought to be taught and how best to align those princi-
ples with composition course goals. This matter of focus, we
believe, is crucial to the design of composition curricula and
instruction. Composition courses which are not clearly focused
are not likely to have the positive effects on student per-

formance that were reported in the present study for the two curricula or that were reported for the "experimental" classes in the Miami University sentence-combining study or in the University of North Dakota study of generative rhetoric. We believe that both the courses in the present study and those used as "experimental" classes in the two previous studies were clearly focused courses, courses which had clearly defined sets of goals or objectives that could be articulated to the students enrolled in them. In contrast, most "traditional" freshman writing classes are not as clearly focused, relying as they do on textbooks such as McCrimmon's Writing with a Purpose which try to provide a little something for every teacher. While such a textbook publishing philosophy may insure greater sales, it does not seem to us that it has a happy effect on student writing, unless the textbook itself is made to serve the needs of a clearly focused course syllabus. Adelstein and Pival's The Writing Commitment--the textbook which served as the rhetoric in the "analytic" or "traditional" writing classes in the present study--is a textbook which, like Writing with a Purpose, was apparently published with the idea of providing something for every teacher. In the present study, however, the textbook was made clearly subordinate to a very carefully designed and clearly focused course syllabus reflecting an "aims and modes" approach to freshman composition. Both the students enrolled in the "analytic" or "traditional" courses

examined in the present study and the teachers teaching those
classes had a very clear sense of what the goals of the course
were. Every assignment was specifically directed toward
realizing one or more of those goals. We suspect that the
lack of clearly articulated goals for "traditional" writing
courses is the principal reason those courses seem always to
come up short when compared to "sentence-based" approaches to
freshman composition.

The present study also seems to have a number of impli-
cations for research in written composition. Paramount is the
need for better design in writing program evaluation studies.
This point has been made again and again in connection with
the multitude of variables which influence the results of
evaluation studies. Such studies require sophisticated designs
employing a variety of assessment measures.

Several specific research issues are also raised: First,
it seems to us that another major study of generative rhetoric
is in order. Building on the previous work of Faigley at North
Dakota and on the findings of the present study, a new major
study of generative rhetoric could focus more sharply on the
instructional and curricular variables conflated in generative
rhetoric and could attempt to identify those variables which
contribute to improved writing having different purposes and
written in different modes. Second, our comparison of the
design and the results of the present study to the design and

the results of the Miami University sentence-combining study
strongly points to the need for another comparison of the
sentence-combining approach and the "traditional" approach
to freshman composition. With well-designed courses on both
sides of such a comparison and with adequate control of the
major curricular and instructional variables, such as a study
would do much to advance current pedagogical practice. Third,
the relatively poor predictive power of the syntactic measures
used in the present study strongly suggests the need to develop
other indices for quantifying growth among college writers. On
the basis of the detailed analyses in Chapter 3 of a small
sample of the essays collected for the present study, we would
speculate that such indices would have to measure; and thereby
quantify, semantic relationships that extend across sentence
boundaries instead of focusing on sentence-level structures or
features. Fourth, our finding that neither of the curricula
nor any of the instructional methodologies we studied seemed
to affect the degree to which student writers were apprehen-
sive about the writing they did indicates that composition
researchers need (1) to develop specific ways to reducing
writing apprehension among student writers and (2) to develop
specific instructional methods for teaching student writers
who are highly apprehensive. A fifth area which we see as
potentially important would focus on the relationship between
the ways students comprehend written texts they read and the

decisions they make about the texts they write. Although
reading and writing are two clearly distinct and distinguish-
able cognitive activities, it would seem profitable to
determine whether the texts students write contain the same
kinds of semantic structures they can easily process in
reading.

The present study, of course, has other implications
for both teaching and research. The few we have chosen to
single out should suggest the importance of the present study
in its larger context. The limitations and the\implications
of empirical studies are inextricably bound together, and the
questions related to any issue of language use or development
are complex and great in number. All that empirical research-
ers and composition teachers can expect is that each subsequent
research study will answer some questions not answered in its
predecessors. A few of these questions the present study
answers. A great many more remain.

FIGURES AND TABLES

E 306 CURRICULUM

ANALYTIC CURRICULUM

SYNTHETIC CURRICULUM
STP

WC   306S

WC
(conv)

WC
(tut)

306S
(conv)

306S
(tut)

STP
(conv)

STP
(tut)

WC
HB

WC
32

WC
HB

WC
32

306S
HB

306S
32

306S
HB

306S
32

STP
HB

STP
32

STP
HB

STP
32

WC	WC	WC	WC	WC	WC	WC	WC	306S	306S	306S	306S	306S	306S	306S	306S	STP	STP	STP	STP	STP	STP	STP	STP
HB	BH	32	32	HB	HB	32	32	HB	HB	32	32	HB	HB	32	32	HB	HB	32	32	HB	HB	32	32
R	CAI	R	CAI	R	CAI	R	CAI	R	CAI	R	CAI	R	CAI	R	CAI	R	CAI	R	CAI	R	CAI	R	CAI

Figure 2.1. A Tree Diagram Illustrating the Possible Combinations of E306 Curricular and Instructional
Variables. (The two E306 options described briefly in Chapter 1 are marked with asterisks;
a legend appears on the following page.)

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303

Legend for Figure 2.1

WC	Adelstein and Pival, The Writing Commitment (rhetoric text)
306S	Rodi, Teaching Syllabus for E306 (rhetoric text)
STr	Wittig, Steps to Structure (rhetoric text)
conv	conventional (lecture/discussion) classroom instruction
tut	tutorial instruction
HB	Corder, Handbook of Current English (usage)
32	Blumenthal, English 3200 (usage)
R	Decker, Patterns in Exposition 6 (reader)
CAI	computer assisted instruction

E 306 CURRICULUM

ANALYTIC CURRICULUM (306S)

SYNTHETIC CURRICULUM
STP

WC

306S

STP
(conv)

STP
(tut)

WC
(conv)

WC
(tut)

306S
(conv)

STP (4)
32

STP (5)
32

WC
HB

WC
HB

306S
HB

(N=50)

(N=50)

$T_7 T_8{}_4$
(N=50)

(N=50)

WC (2)
HB
R

306S (3)
HB
R

STP (6)
32
CAI

WC (1)
HB
R

(N=50)

(N=50)

(N=50)

(N=50)

$T_9 T_{10}{}^5$

(N=50)

(N=50)

$T_5 T_6{}^3$

(N=50)

(N=50)

$T_3 T_4{}_2$

$T_1 T_2{}_1$
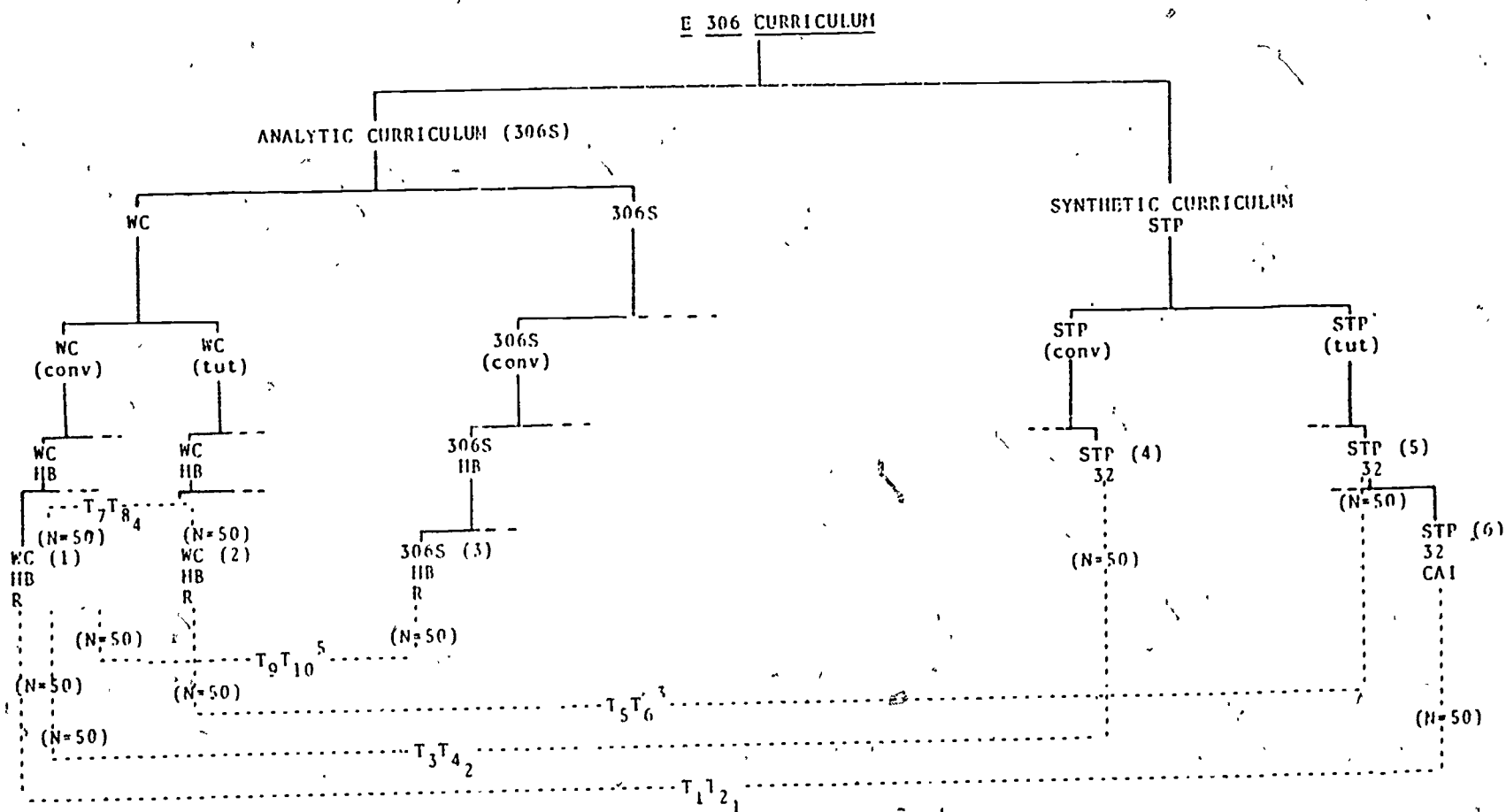
Figure 2.2.   An Abridged Tree Diagram Showing the Five Principal Comparisons in the Present Study

(A legend appears on the following page.)

305

306

Legend for Figure 2.2

WC	The Writing Commitment (rhetoric)
306S	Teaching Syllabus for E306 (rhetoric)
STP	Steps to Structure (rhetoric)
conv	Conventional Medium of Instruction (Classroom)
tut	Tutorial Medium of Instruction
HB	Handbook of Current English (Grammar/Usage)
32	English 3200 (Grammar/Usage)
R	Patterns of Exposition (Reader)
CAI	Computer-Assisted Instruction
T_1-T_{10}	Teachers (Each T designated for a given pair of courses were assigned one section [n=25] of each course in the pair.)
- - - -	Lines consisting of dashes connect courses paired for comparison.
(1-6)	Designates course compared.
1	Comparison of analytic-conventional course (1) with synthetic-tutorial course (6) -- testing for course effectiveness
2	Comparison of analytic-conventional course (1) with synthetic-conventional course (4) -- testing for effect of content
3	Comparison of analytic-tutorial course (2) with synthetic-tutorial course (5) -- testing for effect of content
4	Comparison of analytic-conventional course (1) with analytic-tutorial course (2) -- testing for effect of instructional medium
5	Comparison of analytic-conventional course (1) with analytic-conventional course (3) -- testing for effect of rhetoric text

Principal Comparisons	Section No. & Descriptor	A1/B1 Writing Topics Pretest		A1/B1 Writing Topics Posttest		A2/B2 Writing Topics Pretest		A2/B2 Writing Topics Posttest	
		A_1	B_1	A_1	B_1	A_2	B_2	A_2	B_2
1	01 AC/Conv	X			X		X	X	
	02 AC/Conv		X	X		X			X
	12 SC/LabTut		X	X		X			X
	04 SC/LabTut	X			X		X	X	
2	05 AC/Conv	X			X		X	X	
	06 AC/Conv		X	X		X			X
	07 SC/Conv		X	X		X			X
	08 SC/Conv	X			X		X	X	
3	17 AC/Conv	X			X		X	X	
	18 AC/Conv		X	X		X			X
	19 ACSyll/Conv		X	X		X			X
	20 ACSyll/Conv	X			X		X	X	
4	13 AC/Conv	X			X		X	X	
	14 AC/Conv		X	X		X			X
	15 AC/Tut		X	X		X			X
	16 AC/Tut	X			X		X	X	
5	09 AC/Tut	X			X		X	X	
	10 AC/Tut		X	X		X			X
	21 SC/Tut		X	X		X			X
	03 SC/Tut	X			X		X	X	

Table 2.1. Pretest and Posttest Administration of Writing Topics to Eliminate Bias ("X" indicates the pretest and posttest topics administered to each section).

Derivative Comparisons	N	Sections Involved
(1) AC/Conv	90	01, 02, 05, 06, 13, 14, 17, 18, 19, 20
SC/Conv	18	07, 08
(2) AC/Conv	90	01, 02, 05, 06, 13, 14, 17, 18, 19, 20
SC/Tut	36	12, 04, 21, 03
(3) Conv	108	01, 02, 05, 06, 07, 08, 13, 14, 17, 18, 19, 20
Tutorial	72	12, 04, 09, 10, 21, 03, 15, 16
(4) AC	126	01, 02, 05, 06, 09, 10, 13, 14, 15, 16, 17, 18, 19, 20
SC	54	12, 04, 07, 08, 21, 03
(5) AC/Conv	90	01, 02, 05, 06, 13, 14, 17, 18, 19, 20
AC/Tut	36	09, 10, 15, 16

Table 2.2.   A Delineation of E306 Sections Involved in the

Five Derivative Comparisons.

Scores Tests	1	2	3	4
A_1B_1 Pretests (N=360)	75	146	109	30
A_1B_1 Posttests (N=360)	54	128	119	59
A_2B_2 Pretests (N=360)	96	130	89	45
A_2B_2 Posttests (N=360)	66	100	108	86
A_1B_1 Pre- and Posttests (N=720)	129	274	228	89
A_2B_2 Pre- and Posttests (N=720)	162	230	197	131
A_1B_1 and A_2B_2 Pretests (N=720)	171	276	198	75
A_1B_1 and A_2B_2 Posttests (N=720)	120	228	227	145
All Topic, Pre and Post (N=1440)	291	504	425	220

Table 2.3. Distribution of Holistic Scores from Low Quality (1)
to High Quality (4) for 720 E 306 Essays (N =
no. of essays X no. of raters for each essay).

Tests \ Scores	1	2	3	4
A_1B_1 Pretests (N=360)	20.8	40.6	30.3	8.3
A_1B_1 Posttests (N=360)	15.0	35.6	33.0	16.4
A_2B_2 Pretests (N=360)	26.7	36.1	24.7	12.5
A_2B_2 Posttests (N=360)	18.3	27.8	30.0	23.9
A_1B_1 Pre- and Posttests (N=720)	17.9	38.0	31.7	12.4
A_2B_2 Pre- and Posttests (N-720)	22.5	31.9	27.4	18.2
A_1B_1 and A_2B_2 Pretests (N=720)	23.8	38.8	27.5	10.4
A_1B_1 and A_2B_2 Posttests (N=720)	16.7	31.7	31.5	20.1
All Topics, Pre and Post (N=1440)	20.2	35.0	29.5	15.3

Table 2.4. Percentage of Holistic Scores Distributed Across
All Scoring Categories from Low Quality (1)
to High Quality (4) for 720 E 306 Essays
(N = no. of essays X no. of raters for each
essay).

Scores / Tests	2	3	4	5	6	7	8
A_1B_1 Pretests (N=180)	23	29	30	57	14	24	3
A_1B_1 Posttest (N=180)	11	32	27	42	19	39	10
A_2B_2 Prestest (N=180)	26	44	23	40	13	23	11
A_2B_2 Posttests (N=180)	17	32	18	32	17	42	22
A_1B_1 Pre- & Posttests (N=360)	34	61	57	99	33	63	13
A_2B_2 Pre- & Pos tests (N=360)	43	76	41	72	30	65	33
A_1B_1 & A_2B_2 Pretests (N=360)	49	73	53	97	27	47	14
A_1B_1 & A_2B_2 Posttests (N=360)	28	64	45	74	36	81	32
All Topics Pre and Post (N=720)	77	137	98	171	63	128	46

Table 2.5. Distribution of Summed Holistic Scores from Low Quality (2) to High Quality (8) for E306 Essays (N = no. of essays).

Tests	Scores						
	2	3	4	5	6	7	8
A_1B_1 Pretests (N=180)	12.7	16.1	16.7	31.7	7.8	13.3	1.
A_1B_1 Posttests (N=180)	6.1	17.8	15.0	23.3	10.5	21.7	5.
A_2B_2 Pretests (N=180)	14.4	24.4	12.8	22.2	7.2	12.8	6.
A_2B_2 Posttests (N=180)	9.4	17.8	10.0	17.8	9.4	23.3	12.
A_1B_1 Pre- & Posttests (N=360)	9.4	16.9	15.8	27.5	9.2	17.5	3.
A_2B_2 Pre- & Posttests (N=360)	11.9	21.1	11.4	20.0	8.3	18.1	9.
A_1B_1 & A_2B_2 Pretests (N=360)	13.6	20.3	14.7	26.9	7.5	13.1	3.
A_1B_1 & A_2B_2 Posttests (N=360)	7.8	17.8	12.5	20.6	10.0	22.5	8.
All Topics Pre & Post (N=720)	10.7	19.0	13.6	23.8	8.7	17.8	6.

Table 2.6.   Percentage of Holistic Scores Distributed Across All Scoring Categories from Low Quality (2) to High Quality (8) for E306 Essays (N = no. of essays).

Length Factors	Means for "High Quality" Essays	Means for "Low Quality" Essays	Differences Between Means
Words	645.6	270.4	375.2
Sentences	35.8	16.0	19.8
T-Units	42.2	19.8	22.4
Total Clauses	69.6	36.2	33.4

Table 3.1. Length Factors Describing Five "High Quality" and Five "Low Quality" E 306 Essays Written on Topic A₁.

Types of Error	Frequency of Occurrence (in words)		Difference
	High Quality Essays	Low Quality Essays	
Punctuation	189.88	79.53	111.35
End-Stop	1614.00	193.14	1420.86
Within-Sentence	215.20	135.20	80.00
Grammar	403.50	169.00	234.50
Verb	1614.00	676.00	938.00
Pronoun	645.60	270.40	375.20
Modification	3228.00	1352.00	1876.00
Spelling	269.00	64.38	204.62
ALL ERRORS	87.24	29.39	57.85

Table 3.2.   The Frequency (in words) of Certain Common Usage Errors of Three Types in "High" and "Low" Quality E 306 Essays.

Types of Error	Frequency of Occurrence (in T-Units)		Difference
	High Quality Essays	Low Quality Essays	
Punctuation	12.41	5.82	6.59
End-Stop	105.50	14.14	91.36
Within-Sentence	14.07	9.90	4.17
Grammar	26.38	12.38	14.00
Verb Tense	105.50	49.59	56.00
Pronoun	42.50	19.80	22.70
Modification	211.00	99.00	112.00
Spelling	17.58	4.71	12.87
ALL ERRORS	5.70	2.15	3.55

Table 3.3. The Frequency (in T-units) of Certain Common Usage Errors
of Three Types in "High" and "Low" Quality E 360 Essays.

Types of Error	Frequencies of Error		
	in words	in T-units	per 1000 words
Punctuation	134.7	9.12	7.42
End-Stop	508.8	34.44	1.97
Within-sentence	183.2	12.40	5.46
Grammar	286.3	19.38	3.49
Verbs	1145.0	77.50	0.87
Pronouns	458.0	31.00	2.18
Modification	2290.0	155.00	0.44
Spelling	138.8	9.40	7.20
ALL ERRORS	55.2	3.73	18.12

Table 3.4. Frequency of Error Calculated in Terms of Total Words and
Total T-units and er 1000 Words in the Total Discourse
Sample Collected from Five "High" and Five "Low" Quality
E306 Students.

	Mean % of Total Words in Free Modifiers	% in Initial Free Modifiers	% in Medial Free Modifiers	% in Final Free Modifiers
University of N.D Freshmen	16.1	11.8	0.8	3.5
Hall-Emblen Writers	30.03	8.8	4.2	17.3

Table 3.5. Faigley's (1979a) Comparison of the Occurrence of Free Modifiers in the Writing of University of North Dakota Freshmen and of Writers Anthologized in Hall and Emblen's A Writer's Reader.

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Indices of Syntactic Complexity	Means for "High" and "Low" Quality Essays	Means for "High" Quality Essays	Means for "Low" Quality Essays	Differences Between Means of "High and "Low" Quality Essays
words/T-units	14.48	15.30	13.66	1.64
words/clauses	8.33	9.28	7.47	1.81
clauses/T-units	1.74	1.65	1.83	-0.18
T-units/sentences	1.21	1.18	1.24	-0.06
words/sentences	17.48	18.03	19.90	1.13

Table 3.6. A Comparison of the Syntactic Complexity of "High" and "Low" Quality E 306 Essays, Based on Hunt's (1965) Five Indices of Syntactic Maturity or Complexity.

	Mean % of Total Words in Free Modifiers	% in Initial Position	% in Medial Position	% in Final Position
"High" Essays	10.56	4.12	1.61	4.83
"Low" Essays	5.77	---	1.63	4.14
All Essays	9.15	2.90	1.62	4.63

Table 3.7. Percent of Total Words in Free Modifiers in "High"

and "Low" Quality E 306 Essays.

	Mean % of Total T-units with Free Modifiers	% with Initial Free Modifiers	% with Medial Free Modifiers	% with Final Free Modifiers
"High Essays	28.44	13.74	6.64	8.06
"Low" Essays	10.10	--------	3.03	7.07
All Essays	22.53	9.35	5.48	7.74

Table 3.8. Percent of Total T-units with Free Modifiers in "High" and "Low" Quality E 306 Essays.

Indices and Studies	G3	G4	G5	G7	G8	G12	Coll. Fresh.	Skilled Adults
Words/T-units								
Cooper, et al.							16.54	20.46
Faigley							14.50	19.00
Hunt		8.60			11.50	14.40		20.30
O'Donnell, et al.	7.67		9.34					
Stewart							14.60	
Sodowsky & Witte							15.12	
Present							14.48	
Words/Clauses								
Cooper, et al.							10.16	11.60
Faigley							8.90	11.30
Hunt		6.60			8.10	8.60		11.50
O'Donnell, et al.	6.50		7.40	7.70				
Stewart							3.76	
Sodowsky & Witte							9.28	
Present							8.33	
Clauses/T-units								
Cooper, et al.								
Faigley							1.62	1.67
Hunt		1.30			1.42	1.68		1.78
O'Donnell, et al.	1.18		1.27	1.30				
Stewart								
Sodowsky & Witte							1.66	
Present							1.74	
T-units/Sentences								
Cooper, et al.								
Faigley								
Hunt		1.60			1.37	1.17		1.23
O'Donnell, et al.								
Stewart								
Sodowsky & Witte							1.18	
Present							1.21	
Words/Sentences								
Cooper, et al.								
Faigley								
Hunt		13.50			15.90	16.90		24.70
O'Donnell, et al.								
Stewart								
Sodowsky & Witte							17.57	
Present							17.48	

Table 3.9. The Pooled Scores for "High" and "Low" Quality E306
Essays ("Present") for Hunt's Five Indices in
Comparison to Scores Reported by Cooper, et al.
(1979), FAigley (1979b), Hunt (1965), O'Donnell,
et al. (1967), Stewart (1978a), and Sodowsky and
Witte (1978).

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	% of Words in Medial Free Mods.	% of Words in Final Free Mods.	% of T-units with Final Free Mods.
E 306 Essays	1.62	4.63	7.74
U of N. Dakota Essays	N.A.	3.81	5.40
Stanford U. Essays	2.00	3.00	N.A.

Table 3.10.   A Comparison of the Occurrence of Free Modifiers in
the Written Discourse of E 306 Essays, University
of North Dakota Essays (Faigley, 1979b), and
Stanford University Essays (Nold and Freedman,
1977).

Pronoun Type	% of Words in "High" Quality Essays	% of Words in "Low" Quality Essays	Difference
First Person	0.49	0.89	-0.40
Second Person	0.06	3.55	-3.49
First & Second Person	0.56	4.44	-3.88

Table 3.11. The Occurrence of First- and Second-Person Pronouns

Expressed in Terms of the Percentage of Words in

"High" and "Low" Quality E 306 Essays.

Pronoun Type	Frequency in "High" Quality Essays		Frequency in "Low" Quality Essays		Differences	
	in words	in T-units	in words	in T-units	in words	in T-units
First Person	201.75	13.19	112.67	8.25	89.08	4.94
Second Person	1614.00	105.50	28.17	2.06	1585.83	103.44
First & Second Person	179.33	11.72	22.53	1.65	156.80	10.07

Table 3.12. The Frequency in Words and T-Units of the Occurrence of First- and Second

Person Pronouns in "High" and "Low" Quality E 306 Essays.

	W / CT Type		CT Type / T		% of CT		CT per 100 T	
	Low	High	Low	High	Low	High	Low	High
Per Pronoun	233.00	63.40	0.510	0.257	2.10	5.04	5.10	25.70
Demon. & Art.	77.67	58.89	0.156	0.277	6.29	5.44	15.60	27.70
Comparative	43.69	53.19	0.271	0.307	11.18	6.02	27.10	30.70
REFERENCE (all)	24.96	19.40	0.478	0.841	19.57	16.50	47.80	84.10

Table 3.13. Summary of Reference Cohesion in "High" and "Low" Quality E 306 Essays.

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	W / CT Type		CT Type / T		% of CT		CT per 100 T	
	Low	High	Low	High	Low	High	Low	High
Nominal Sub.	349.5	329.8	0.034	0.050	1.40	0.96	3.40	5.00
Verbal Sub.	---	329.8	---	0.050	---	0.96	---	5.00
Clausal Sub.	---	549.7	---	0.029	---	0.57	---	2.90
SUBSTITUTION (All)	349.5	126.9	0.034	0.129	1.40	2.49	3.40	12.90

Table 3.14. Summary of Substitution Cohesion in "High" and "Low" Quality E 306 Essays.

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	W / CT Type		CT Type / T		% of CT		CT per 100 T	
	Low	High	Low	High	Low	High	Low	High
Nominal Ell.	139.8	329.8	0.085	0.049	3.50	0.96	8.50	5.00
Verbal Ell.	699.0	824.5	0.017	0.020	0.70	0.38	1.70	1.90
Clausal Ell.	---	235.6	---	0.069	---	1.34	---	6.90
ELLIPSIS (all)	116.5	117.8	0.102	0.138	4.20	2.68	10.20	13.80

Table 3.15. Summary of Ellipsis Cohesion in "High" and "Low" Quality E 306 Essays.

	W / CT Type		CT Type / T		% of CT		CT per 100 T	
	Low	High	Low	High	Low	High	Low	High
additive conj.	116.50	71.70	0.102	0.288	4.20	4.41	10.20	22.80
adversative conj.	---	164.90	---	0.099	---	1.91	---	9.90
causal conj.	699.00	117.79	0.017	0.139	0.70	2.68	1.70	13.90
temporal conj.	139.80	206.13	0.085	0.079	3.50	1.53	8.50	7.90
continuative conj.	---	149.91	---	0.109	---	2.11	---	10.90
CONJUNCTION (all)	58.25	24.99	0.204	0.654	8.40	12.64	20.40	65.40

Table 3.16. Summary of Conjunctive Cohesion in "High" and "Low" Quality E 306 Essays.

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	W / CT Type		CT Type / T		% of CT		CT per 100 T	
	Low	High	Low	High	Low	High	Low	High
same item	11.27	9.11	1.051	1.792	43.35	34.67	105.10	179.20
synonym	58.25	33.65	0.203	0.485	8.39	9.39	20.30	48.50
superordinate	---	274.83	---	0.059	---	1.15	---	5.90
general item	174.75	126.85	0.068	0.129	3.80	2.49	6.80	12.90
collocation	41.12	17.36	0.288	0.941	11.89	18.20	28.80	94.10
LEXICAL (all)	7.36	4.79	1.610	3.406	66.43	65.90	161.00	340.60

Table 3.17.   Summary of Lexical Cohesion in "High" and "Low" Quality E 306 Essays.

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	"Low" Quality Essays	"High" Quality Essays
same item	65.26 %	52.62 %
synonym	12.63 %	14.24 %
superordinate	---	1.74 %
general item	4.21 %	3.78 %
collocation	17.90 %	27.62 %

Table 3.18. Percentage of Lexical Ties Attributed to the Five Types of Lexical Cohesion in "High" and "Low" Quality E 306 Essays.

	Ratio of Ties to Words		Cohesive Type as % of Total Words	
	Low	High	Low	High
Reference	0.0400	0.0515	4.00	5.15
Substitution	0.0029	0.0080	0.29	0.80
Ellipsis	0.0086	0.0085	0.86	0.85
Conjunction	0.0172	0.0400	1.72	4.00
Lexical	0.1359	0.2086	13.59	20.86
ALL COHESIVE TIES	0.2046	0.3166	20.46	31.66

Table 3.19. Summary of the Ratio of Cohesive Ties to Total Words
(Together with a Conversion to Percentages of
Total Words) for "High" and "Low" Quality E 306
Essays.

	"Low" Quality Essays	"High" Quality Essays
Immediate Ties	32.80%	41.59%
Remote Ties	26.69%	26.94%
Mediated Ties	0.79%	5.61%
Remote-Mediated Ties	36.72%	25.86%

Table 3.20.   Percentage of Total Cohesive Ties Represented
by Four "Span of Text" Cohesive Ties Cate-
gories in "High" and "Low" Quality E 306
Essays.

Factor	Pretest Mean	S.D	Posttest Mean	S.D	Difference	S.D	T-value	Significance
A₁B₁ Topics								
Words	429.35	148.90	429.98	136.20	-0.63	117.58	-0.07	N.S.
Words/T-units	15.26	3.02	15.28	2.77	-0.02	3.46	-0.08	N.S.
Words/Clauses	8.92	1.51	9.03	1.47	-0.11	1.84	-0.81	N.S.
Ratio of TUs with FFM	0.048	0.06	0.050	0.06	-0.002	0.07	-0.36	N.S.
Ratio of Words in FFM	0.027	0.04	0.029	0.04	-0.002	0.05	-0.43	N.S.
Holistic Score	4.52	1.58	5.02	1.70	-0.49	2.02	-3.28	.001
A₂B₂ Topics								
Words	438.47	134.99	477.40	144.22	-38.93	132.24	-3.95	.001
Words/T-units	16.96	3.61	16.84	3.38	0.12	4.27	0.38	N.S.
Words/Clauses	10.54	1.65	10.40	1.85	0.14	2.15	0.89	N.S.
Ratio of TUs with FFM	0.039	0.05	0.048	0.06	-0.009	0.07	-1.72	N.S.
Ratio of Words in FFM	0.020	0.03	0.027	0.03	-0.006	0.04	-2.10	.037
Holistic Score	4.47	1.80	5.19	1.94	-0.72	2.35	-4.13	.001

Table 4.1. Paired T-Tests (N=180) of Change Scores on Writing Samples for All 180 Students in the 20 E 306 Sections Regardless of Instructional or Curricular Treatment.

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Indices and Studies	G3	G4	G5	G7	G8	G12	College Freshmen	Skilled Adults
Words/T-units								
Cooper, et al.							16.54	20.46
Faigley							14.50	19.00
Hunt		8.60			11.50	14.40		20.30
O'Donnell, et al.	7.67		9.34	9.77				
Stewart							14.60	
Sodowsky & Witte							15.12	
A_1B_1 Topics							15.26	
A_2B_2 Topics							16.96	
Words/Clauses								
Cooper, et al.							10.16	11.60
Faigley							8.90	11.30
Hunt		6.60			8.10	8.60		11.50
O'Donnell, et al.	6.50		7.40	7.70				
Stewart							8.76	
Sodowsky & Witte							9.29	
A_1B_1 Topics							8.32	
A_2B_2 Topics							10.54	

<u>Table 4.2.</u>   The Means for A_1B_1 and A_2B_2 E 306 Pretest Essays for "Words per T-Unit" and "Words per Clause" in Comparison to Means Reported by Cooper, et al. (1980), Faigley (1979b), Hunt (1965), O'Donnell, et al. '1967), Stewart (1978a), and Sodowsky and Witte (1978).

McGraw-Hill Writing Test: Forms and Sections	Mean	S.D	Difference Between Mean Scores
Section I: Language Mechanics			
Form A	17.49	4.40	
			2.86
Form B	20.35	4.50	
Section II: Sentence Patterns			
Form A	15.78	3.95	
			0.34
Form B	15.44	4.40	
Section III: Paragraph Patterns			
Form A	10.69	2.69	
			0.63
Form B	10.06	2.68	
Total Raw Score			
Form A	43.96	N.A.	
			1.90
Form B	45.86	N.A.	

Table 4.3. Means for the McGraw-Hill Writing Test Norming Group (see Raygor, 1970b, p. 26).

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McGraw-Hill Reading Test: Paragraph Comprehension	Mean	S.D	Difference Between Mean Scores
Form A	18.57	4.84	0.64
Form B	19.21	4.90	

Table 4.4. Means for the McGraw-Hill Reading Test: Paragraph
Comprehension Norming Group (see Raygor, 1970a,
p. 30).

Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	165	18.86	3.36	22.01	4.02	-3.15	3.38	-10.43	.001
Sentence Patterns	165	16.22	3.19	17.04	3.31	-0.82	3.33	- 3.16	.002
Paragraph Patterns	165	11.64	2.43	11.39	1.76	0.25	2.77	1.15	N.S.
Total Writing	165	46.72	6.36	50.44	7.12	-3.72	6.27	- 7.63	.001
McGraw-Hill Reading Test									
Reading Comprehension	159	20.11	3.99	20.89	3.56	-0.78	4.26	- 2.33	.021
Daly-Miller Writing Apprehension Test	159	69.92	16.09	70.37	16.18	-0.45	11.21	- 0.50	N.S.

Table 4.5. Paired T-Tests of Change Scores on Objective Tests for Students in the 20 E 306

Sections Regardless of Instructional or Curricular Treatment.

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Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	441.43	146.63	421.63	129.04	19.80	122.62	1.53	N.S.
Words/T-units	15.41	3.05	15.29	2.87	0.12	3.54	0.31	N.S.
Words/Clauses	8.94	1.46	9.10	1.65	- 0.16	2.14	-0.73	N.S.
Ratio of TUs with FFM	0.051	0.05	0.056	0.07	- 0.005	0.08	-0.63	N.S.
Ratio of Words in FFM	0.030	0.04	0.033	0.04	- 0.003	0.05	-0.58	N.S.
Holistic Score	4.53	1.52	5.19	1.61	- 0.66	1.95	-3.19	.002
A_2B_2 Topics								
Words	442.89	142.66	454.36	130.62	-11.47	116.86	-0.93	N.S.
Words/T-units	17.05	3.80	16.82	3.63	0.23	4.69	0.47	N.S.
Words/Clauses	10.62	1.73	10.25	1.85	0.36	2.38	1.44	N.S.
Ratio of TUs with FFM	0.042	0.05	0.038	0.05	0.004	0.07	0.59	N.S.
Ratio of Words in FFM	0.022	0.03	0.020	0.03	0.002	0.04	0.51	N.S.
Holistic Score	4.73	1.87	5.37	1.95	- 0.63	2.32	-2.60	.011

Table 4.6. Paired T-Tests (N=90) of Change Scores on Writing Samples for All "Analytic-Conventional" Sections (01, 02, 05, 06, 13, 14, 17, 18, 19, and 20) in Derivative Comparisons 1, 2, and 5 (see Table 2.2).

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	465.00	160.29	480.39	152.42	- 15.39	82.95	-0.79	N.S.
Words/T-units	14.43	2.80	15.54	3.00	- 1.11	3.13	-1.50	N.S.
Words/Clauses	8.70	1.53	9.18	1.25	- 0.49	1.19	-1.75	N.S.
Ratio of TUs with FFM	0.020	0.02	0.031	0.03	- 0.012	0.04	-1.21	N.S.
Ratio of Words in FFM	0.011	0.02	0.020	0.02	- 0.008	0.03	-1.29	N.S.
Holistic Score	4.44	1.29	5.11	1.91	- 0.67	2.50	-1.13	N.S.
A_2B_2 Topics								
Words	458.94	152.18	575.94	189.72	-117.00	125.87	-3.94	.001
Words/T-units	15.86	3.20	17.50	3.70	- 1.64	3.51	-1.98	N.S.
Words/Clauses	10.57	1.89	10.74	1.38	- 0.17	1.37	-0.53	N.S.
Ratio of TUs with FFM	0.032	0.04	0.064	0.05	- 0.032	0.06	-2.38	.029
Ratio of Words in FFM	0.018	0.03	0.037	0.03	- 0.019	0.04	-2.22	.041
Holistic Score	4.33	1.72	5.06	1.83	- 0.72	2.42	-1.27	N.S.

Table 4.7. Paired T-tests (N=18) of Change Scores on Writing Samples for "Synthetic-Conventional" Sections (07, 08) in Derivative Comparison 1 (see Table 2.2).

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Factor	F-ratio	Level of Significance
Essay Length	2.98	N.S.
T-Unit Length	0.55	N.S.
Clause Length	0.08	N.S.
Ratio of T-Units with Final Free Modifiers	1.12	N.S.
Ratio of Words in Final Free Modifiers	1,01	N.S,
Holistic Score	0.21	N.S.

Table 4.8. Comparison of Posttest Means on A_1B_1 Topic Data with

Pretest Scores Covaried for "Analytic-Conventional"

and "Synthetic-Conventional" Sections in Derivative

Comparison 1 (see Table 2.2).

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Factor	F-ratio	Level of Significance
Essay Length	16.08	.001
T-Unit Length	1.08	N.S.
Clause Length	1.19	N.S.
Ratio of T-Units with Final Free Modifiers	4.37	.039
Ratio of Words in Final Free Modifiers	4.93	.029
Holistic Score	0.19	N.S.

Table 4.9. Comparison of Posttest Mean Scores on A_2B_2 Topic Data with Pretest Scores Covaried for "Analytic-Conventional' and "Synthetic-Conventional" Sections in Derivative Comparison No. 1 (see Table 2.2).

Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	80	18.92	3.40	.21	4.29	- 2.87	4.29	- 5.99	.001
Sentence Patterns	80	16.65	2.97	16.90	2.80	- 0.25	3.12	- 0.72	N.S.
Paragraph Patterns	80	11.45	2.85	11.43	1.90	0.03	3.36	0.07	N.S.
Total Writing	80	47.01	5.93	50.11	7.06	- 3.10	6.92	- 4.01	.001
McGraw-Hill Reading Test									
Reading Comprehension	82	20.28	3.24	21.46	2.85	- 1.18	3.57	- 3.00	.004
Daly-Miller Writing Apprehension Test	84	68.39	16.21	69.17	17.11	- 0.79	11.42	- 0.63	N.S.

Table 4.10.. Paired T-Tests of Change Scores on Objective Tests for All "Analytic-Conventional" Sections (01, 02, 03, 06, 13, 14, 17, 18, 19, and 20) in Derivative Comparisons 1, 2, and 5 (see Table 2.2).

Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	16	19.37	2.31	23.32	2.44	- 3.94	3.24	- 4.87	.001
Sentence Patterns	16	15.37	1.93	17.94	2.54	- 2.56	2.96	- 3.46	.004
Paragraph Patterns	16	12.50	1.27	11.19	1.11	1.31	1.92	2.73	.015
Total Writing	16	47.25	4.12	52.44	4.84	- 5.19	6.18	- 3.36	.004
McGraw-Hill Reading Test									
Reading Comprehension	17	20.94	4.15	20.53	3.48	0.41	4.54	0.37	N.S.
Daly-Miller Writing Apprehension Test	18	70.17	14.89	69.11	17.70	1.06	9.76	0.46	N.S.

Table 4.11. Paired T-Tests of Change Scores on Objective Tests for "Synthetic-Conventional"

Sections (07, 08) in Derivative Comparison No. 1 (see Table 2.2).

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Factor	F-ratio	Level of Significance
McGraw-Hill Writing Test		
Language Patterns	1.60	N.S.
Sentence Patterns	4.55	.036
Paragraph Patterns	0.25	N.S.
Total Score	1.70	N.S.
McGraw-Hill Reading Test		
Paragraph Comprehension	2.18	N.S.
Daly-Miller Writing Apprehension Test	0.30	N.S.

Table 4.12. Comparison of Posttest Mean Scores on Objective

Test Data with Pretest Scores Covaried for

"Analytic-Conventional" and "Synthetic-Conven-

tional" Sections in Derivative Comparison

No. 1 (see Table 2.2).

Factor	Pretest		Posttest					
	Mean	S.D.	Mean	S.D	Difference	S.D.	T-Value	Significance
A₁B₁ Topics								
Words	375.53	160.67	435.72	153.51	-60.19	103.59	- 3.49	.001
Words/T-units	15.97	2.85	15.35	2.38	0.62	3.26	1.15	N.S.
Words/Clauses	9.45	1.83	9.06	1.27	0.39	1.71	1.38	N.S.
Ratio of TUs with FFM	0.045	0.06	0.041	0.04	0.004	0.06	0.35	N.S.
Ratio of Words in FFM	0.024	0.04	0.025	0.03	- 0.001	0.04	- 0.10	N.S.
Holistic Score	3.97	1.77	4.44	1.75	- 0.47	2.10	- 1.35	N.S.
A₂B₂ Topics								
Words	428.33	123.23	500.44	151.03	-72.11	168.79	- 2.56	.015
Words/T-units	17.55	3.72	17.14	3.09	0.41	4.02	0.61	N.S.
Words/Clauses	10.50	1.65	10.80	2.37	0.30	2.44	- 0.74	N.S.
Ratio of TUs with FFM	0.036	0.04	0.073	0.07	- 0.037	0.08	- 2.68	.011
Ratio of Words in FFM	0.019	0.02	0.043	0.04	- 0.024	0.04	- 3.35	.002
Holistic Score	4.03	1.77	4.83	2.17	- 0.80	2.57	- 1.88	N.S.

Table 4.13.   Paired T-Tests (N=36) of Change Scores on Writing Samples for All "Synthetic-Tutorial" Sections (12, 04, 21, 03) in Derivative Comparison 2 (see Table 2.2).

Factor	N	Pretest		Posttest		Difference	S.D.	T-Value	Significance
		Mean	S.D.	Mean	S.D				
McGraw-Hill Writing Test									
Language Mechanics	33	18.36	4.16	20.85	4.53	- 2.49	3.35	- 4.27	.001
Sentence Patterns	33	15.40	3.82	16.88	4.66	- 1.48	3.22	- 2.65	.012
Paragraph Patterns	33	11.27	2.32	11.40	2.00	- 0.12	2.06	- 0.34	N.S.
Total Writing	33	45.03	8.44	49.12	9.47	- 4.09	5.57	- 4.22	.001
McGraw-Hill Reading Test									
Reading Comprehension	30	19.13	5.95	20.23	4.51	- 1.10	5.38	- 1.12	N.S.
Daly-Miller Writing Apprehension Test	27	71.03	17.43	71.74	15.63	- 0.70	13.16	- 0.28	N.S.

Table 4.14. Paired T-Tests of Change Scores on Objective Tests for All "Synthetic-Tutorial"

Sections (12, 04, 21, and 03) in Derivative Comparison 2 (see Table 2.2).

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Factor	F-ratio	Level of Significance
Essay Length	6.95	.009
T-Unit Length	0.03	N.S.
Clause Length	0.15	N.S.
Ratio of T-Units with Final Free Modifiers	1.18	N.S.
Ratio of Words in Final Free Modifiers	0.81	N.S.
Holistic Score	3.51	N.S.

Table 4.15. Comparison of Posttest Mean Scores on A_1B_1 Topics Data with Pretest Scores Covaried for "Analytic-Conventional" and "Synthetic-Tutorial" Sections in Derivative Comparison 2 (see Table 2.2).

Factor	F-ratio	Level of Significance
Essay Length	5.42	.022
T-Unit Length	0.10	N.S.
Clause Length	2.12	N.S.
Ratio of T-Units with Final Free Modifiers	9.74	.001
Ratio of Words in Final Free Modifiers	11.96	.001
Holistic Score	0.80	N.S.

Table 4.16. Comparison of Posttest Scores on A_2B_2 Topics Data with Pretest Scores Covaried for "Analytic-Conventional" and "Synthetic-Tutorial" Sections in Derivative Comparison 2 (see Table 2.2).

365

Factor	F-ratio	Level of Significance
McGraw-Hill Writing Test		
Language Mechanics	0.60	N.S.
Sentence Patterns	1.43	N.S.
Paragraph Patterns	0.01	N.S.
Total Score	0.09	N.S.
McGraw-Hill Reading Test		
Paragraph Comprehension	1.63	N.S.
Daly-Miller Writing Apprehension Test	0.05	N.S.

Table 4.17. Comparison of Posttest Mean Scores on Objective Test Data with Pretest Scores Covaried for "Analytic-Conventional" and "Synthetic-Tutorial" Sections in Derivative Comparison 2 (see Table 2.2).

366

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	445.36	148.47	431.43	134.25	13.93	117.36	1.23	N.S.
Words/T-units	15.25	3.02	15.33	2.88	- 0.08	3.49	-0.26	N.S.
Words/Clauses	8.90	1.47	9.12	1.58	- 0.22	2.01	-1.13	N.S.
Ratio of TUs with FFM	0.045	0.05	0.052	0.06	- 0.007	0.07	-0.89	N.S.
Ratio of Words in FFM	0.027	0.03	0.031	0.04	- 0.004	0.05	-0.85	N.S.
Holistic Score	4.52	1.48	5.18	1.66	- 0.66	2 04	-3.35	.001
A_2B_2 Topics								
Words	445.57	143.68	474.62	148.26	-29.06	124.25	-2.43	.017
Words/T-units	16.85	3.71	16.93	3.64	- 0.08	4.56	-0.18	N.S.
Words/Clauses	10.61	1.75	10.33	1.78	0.28	2.25	1.26	N.S.
Ratio of TUs with FFM	0.041	0.05	0.043	0.05	- 0.002	0.07	-0.30	N.S.
Ratio of Words with FFM	0.022	0.03	0.023	0.03	- 0.001	0.04	-0.38	N.S.
Holistic Score	4.67	1.84	5.31	1.93	- 0.64	2.32	-2.90	.005

Table 4.18.   Paired T-Tests (N=108) of Change Scores on Writing Samples for All "Conventional"
Section (01, 02, 05, 06, C7, 08, 13, 14, 17, 18, 19, and 20) in Derivative
Comparison 3 (see Table 2.2).

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Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	405.33	147.31	427.81	139.99	-22.47	115.28	- 1.65	N.S.
Words/T-units	15.28	3.05	15.21	2.61	0.07	3.43	0.20	N.S.
Words/Clauses	8.96	1.57	8.91	1.29	0.05	1.55	0.28	N.S.
Ratio of TUs with FFM	0.051	0.06	0.047	0.06	0.004	0.07	0.52	N.S.
Ratio of Words in FFM	0.029	0.04	0.026	0.03	0.003	0.04	0.45	N.S.
Holistic Score	4.53	1.74	4.78	1.75	- 0.25	1.98	-1.07	N.S.
A_2B_2 Topics								
Words	427.83	121.00	481.57	138.86	-53.74	143.01	-3.19	.002
Words/T-units	17.13	3.46	16.71	2.97	0.42	3.81	-.93	N.S.
Words/Clauses	10.44	1.50	10.49	1.94	- 0.05	2.00	-0.22	N.S.
Ratio of TUs with FFM	0.037	0.05	0.057	0.06	- 0.020	0.08	-2.19	.032
Ratio of Words in FFM	0.018	0.03	0.032	0.04	- 0.014	0.04	-2.77	.007
Holistic Score	4.17	1.71	5.00	1.96	- 0.83	2.40	-2.95	.004

Table 4.19.   Paired T-Tests (N=72) of Change Scores on Writing Samples for All "Tutorial"

Sections (12, 04, 09, 10, 21, 03, 15, and 16) in Derivative Comparison 3

(see Table 2.2).

Factor	F-ratio	Level of Significance
Essay Length	1.80	N.S.
T-Unit Length	0.12	N.S.
Clause Length	1.04	N.S.
Ratio of T-Units with Final Free Modifiers	0.01	N.S.
Ratio of Words in Final Free Modifiers	0.70	N.S.
Holistic Score	2.55	N.S.

Table 4.20. Comparison of Posttest Mean Scores on A_1B_1 Topics
Data with Pretest Scores Covaried for "Conven-
tional" and "Tutorial" Sections in Derivative
Comparison 3 (see Table 2.2).

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Factor	F-ratio	Level of Significance
Essay Length	0.91	N.S.
T-Unit Length	0.34	N.S.
Clause Length	0.56	N.S.
Ratio of T-Units with Final Free Modifiers	2.99	N.S.
Ratio of Words in Final Free Modifiers	3.60	N.S.
Holistic Score	0.48	N.S.

Table 4.21.   Comparison of Posttest Mean Scores on A_2B_2 Topics Data with Pretest Scores Covaried for "Conventional" and "Tutorial" Sections in Derivative Comparison 3 (see Table 2.2).

Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	96	18.99	3.24	22.05	4.07	- 3.05	4.19	- 7.23	.001
Sentence Patterns	96	16.44	2.85	17.07	2.78	- 0.64	3.20	- 2.02	.050
Paragraph Patterns	96	11.63	2.67	11.39	1.79	0.24	3.19	0.73	N.S.
Total Writing	96	47.05	5.65	50.50	6.77	- 3.45	6.81	- 4.96	.001
McGraw-Hill Reading Test									
Reading Comprehension	99	20.40	3.40	21.30	2.97	- 0.91	3.77	0 2.39	.019
Daly-Miller Writing Apprehension Test	102	68.71	15.93	69.17	17.13	- 0.46	1.13	- 0.42	N.S.

Table 4.22. Paired T-Tests of Change Scores on Objective Tests for All "Conventional" Sections (01, 02, 05, 06, 07, 08, 13, 14, 17, 18, 19, and 20) in Derivative Comparison 3 (see Table 2.2).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	69	18.68	3.54	21.99	3.97	- 3.29	3.52	- 7.77	.001
Sentence Patterns	69	15.91	3.60	16.99	3.96	- 1.07	3.50	- 2.55	.013
Paragraph Patterns	69	11.65	2.06	11.39	1.73	0.26	2.06	1.05	N.S.
Total Writing	69	42.65	7.26	50.35	7.62	- 4.10	5.44	- 6.26	.001
McGraw-Hill Reading Test									
Reading Comprehension	60	19.63	4.81	20.22	4.31	- 0.58	4.97	- 0.91	N.S.
Daly-Miller Writing Apprehension Test	57	72.11	16.27	72.53	14.22	- 0.42	11.47	- 0.28	N.S.

Table 4.23.   Paired T-Tests of Change Scores on Objective Tests for All "Tutorial" Sections

(12, 04, 09, 10, 21, 03, 15, and 16) in Derivative Comparison 3 (see Table 2.2).

375   376

Factor	F-ratio	Level of Significance
ᴎcGraw-Hill Writing Test		
Language Mechanics	0.03	N.S.
Sentence Patterns	0.14	N.S.
Paragraph Patterns	0.00	N.S.
Total Score	0.16	N.S.
McGraw-Hill Reading Test		
Paragraph Comprehension	2.41	N.S.
Daly-Miller Writing Apprehension Test	0.19	N.S.

Table 4.24. Comparison of Posttest Mean Scores on Objective
Test Data with Pretest Scores Covaried for
"Conventional" and "Tutorial" Sections in
Derivative Comparison 3 (see Table 2.2).

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	439.63	141.05	421.13	127.88	18.50	120.14	1.73	N.S.
Words/T-units	15.18	3.08	15.23	2.86	- 0.05	3.54	-0.16	N.S.
Words/Clauses	8.80	1.37	9.00	1.56	- 0.20	1.93	-1.17	N.S.
Ratio of TUs with FFM	0.052	0.06	0.054	0.07	- 0.002	0.08	-0.31	N.S.
Ratio of Words in FFM	0.030	0.04	0.031	0.04	- 0.001	0.05	-0.17	N.S.
Holistic Score	4.69	1.54	5.17	1.64	- 0.48	1.94	-2.76	.007
A_2B_2 Topics								
Words	438.44	136.40	456.74	128.54	-18.29	115.27	-1.78	N.S.
Words/T-units	16.95	3.62	16.66	3.42	0.29	4.41	0.74	N.S.
Words/Clauses	10.55	1.63	10.23	1.72	0.31	2.15	1.64	N.S.
Ratio of TUs with FFM	0.041	0.05	0.039	0.05	0.002	0.07	0.38	N.S.
Ratio of Words with FFM	0.021	0.03	0.0205	0.03	0.0005	0.04	0.13	N.S.
Holistic Score	4.61	1.82	5.31	1.89	- 0.70	2.29	-3.43	:001

Table 4.25. Paired T-Tests (N=126) of Change Scores on Writing Samples for All "Analytic" Sections (01, 02, 05, 06, 09, 10, 13, 14, 15, 16, 17, 18, 19, and 20) in Derivative Comparison 4 (see Table 2.2).

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	405.35	164.70	450.61	153.20	-45.26	98.73	- 3.37	.001
Words/T-units	15.46	.2.90	15.41	2.57	0.05	3.29	0.11	N.S.
Words/Clauses	9.20	1.76	9.10	1.25	0.10	1.60	0.46	N.S.
Ratio of TUs with FFM	0.037	0.05	0.038	0.04	- 0.001	0.05	- 0.20	N.S.
Ratio of Words in FFM	0.020	0.03	0.023	0.03	- 0.003	0.04	- 0.63	N.S.
Holistic Score	4.13	1.63	4.67	1.81	- 0.54	2.22	- 1.78	N.S.
A_2B_2 Topics								
Words	438.54	132.91	525.61	167.03	-87.07	156.05	- 4.10	.001
Words/T-units	16.99	3.61	17.26	3.27	- 0.27	3.95	- 0.51	N.S.
Words/Clauses	10.52	1.72	10.78	2.08	- 0.26	2.13	- 0.89	N.S.
Ratio of TUs with FFM	0.035	0.04	0.070	0.06	- 0.035	0.08	- 3.47	.001
Ratio of Words in FFM	0.018	0.02	0.041	0.04	- 0.023	0.04	- 4.04	.001
Holistic Score	4.13	1.74	4.91	2.05	- 0.78	2.50	- 2.29	.026

Table 4.26. Paired T-Tests (N=54) of Change Scores on Writing Samples for All "Synthetic" Sections (12, 04, 17, 18, 21, and 03) in Derivative Comparison 4 (see Table 2.2).

Factor	F-ratio	Level of Significance
Essay Length	9.70	.001
T-Unit Length	0.06	N.S
Clause Length	0.01	N.S.
Ratio of T-Units with Final Free Modifiers	1.72	N.S.
Ratio of Words in Final Free Modifiers	1.00	N.S.
Holistic Score	1.76	N.S.

Table 4.27. Comparison of Posttest Mean Scores on A_1B_1 Topic Data with Pretest Scores Covaried for "Analytic" and "Synthetic" Sections in Derivative Comparison 4 (see Table 2.2).

Factor	F-ratio	Level of Significance
Essay Length	13.17	.001
T-Unit Length	1.22	N.S.
Clause Length	3.66	N.S.
Ratio of T-Units with Final Free Modifiers	12.85	.001
Ratio of Words in Final Free Modifiers	14.63	.001
Holistic Score	0.89	N.S.

Table 4.28   Comparison of Posttest Mean Scores on A_2B_2 Topic Data

with Pretest Scores Covaried for "Analytic" and

"Synthetic" Sections in Derivative Comparison 4

(see Table 2.2).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	116	18.93	3.24	22.16	3.99	- 3.23	4.09	-8.50	.001
Sentence Patterns	116	16.57	3.09	16.96	2.94	- 0.39	3.32	-1.26	N.S.
Paragraph Patterns	116	11.62	2.56	11.41	1.77	0.21	3.02	0.74	N.S.
Total Writing	116	47.12	⁀.89	50.53	6.57	- 3.41	6.48	-5.67	.001
McGraw-Hill Reading Test									
Reading Comprehension	112	20.24	3.25	21.13	3.29	- 0.88	3.87	-2.41	.017
Daly-Miller Writing Apprehension Test	114	69.62	16.07	69.23	16.18	- 0.62	11.01	-0.60	N.S.

Table 4.29. Paired T-Tests of Change Scores on Objective Tests for All "Analytic" Sections (01,
02, 05, 06, 09, 10, 13, 14, 15, 16, 17, 18, 19, and 20) in Derivative Comparison
4 (see Table 2.2).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	49	18.69	3.66	21.65	4.11	- 2.96	3.35	-6.19	.001
Sentence Patterns	49	15.39	3.30	17.22	4.09	- 1.84	3.15	-4.08	.001
Paragraph Patterns	49	11.67	2.10	11.33	1.75	0.35	2.11	1.15	N.S.
Total Writing	49	45.76	7.34	50.20	8.34	- 4.45	5.73	-5.43	.001
McGraw-Hill Reading Test									
Reading Comprehension	47	19.79	5.39	20.34	4.13	- 0.55	5.09	-0.74	N.S.
Daly-Miller Writing Apprehension Test	45	70.68	16.29	70.60	16.43	0.08	11.82	0.01	N.S.

Table 4.30.   Paired T-Tests of Change Scores on Objective Tests for All "Synthetic" Sections (12, 04, 07, 08, 21, and 03) in Derivative Comparison 4 (see Table 2.2).

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Factor	F-ratio	Level of Significance
McGraw-Hill Writing Test		
Language Mechanics	0.39	N.S.
Sentence Patterns	3.06	N.S.
Paragraph Patterns	0.10	N.S.
Total Score	0.30	N.S.
McGraw-Hill Reading Test		
Paragraph Comprehension	1.22	N.S.
Daly-Miller Writing Apprehension Test	0.04	N.S.

Table 4.31. Comparison of Posttest Mean Scores on Objective Test

Data with Pretest Scores Covaried for "Analytic"

and "Synthetic" Sections in Derivative Comparison

4 (see Table 2,2).

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A$_1$B$_1$ Topics								
Words	435.14	127.86	419.89	126.73	15.25	115.33	0.79	N.S.
Words/T-units	14.60	3.12	15.07	2.86	- 0.47	3.55	-0.79	N.S.
Words/Clauses	8.46	1.07	8.75	1.30	- 0.29	1.29	-1.36	N.S.
Ratio of TUs with FFM	0.057	0.06	0.052	0.07	0.005	0.08	0.39	N.S.
Ratio of Words in FFM	0.033	0.04	0.027	0.04	0.006	0.05	0.69	N.S.
Holistic Score	5.08	1.54	5.11	1.72	- 0.03	1.86	-0.09	N.S.
A$_2$B$_2$ Topics								
Words	427.33	120.48	462.69	124.79	-35.36	110.93	-1.91	N.S.
Words/T-units	16.70	3.17	16.27	2.83	0.43	3.64	0.71	N.S.
Words/Clauses	10.38	1.35	10.18	1.36	0.02	1.42	0.82	N.S.
Ratio of TUs with FFM	0.038	0.05	0.041	0.05	- 0.003	0.07	-0.22	N.S.
Ratio of Words in FFM	0.018	0.03	0.022	0.03	- 0.004	0.04	-0.56	N.S.
Holistic Score	4.31	1.67	5.17	1.75	- 0.86	2.24	-2.30	.027

Table 4.32. Paired T-Tests (N=36) of Change Scores on Writing Samples for All "Analytic-Tutorial"
Sections (09, 10, 15, and 16) in Derivative Comparison 5 (see Table 2.2).

Factor	F-ratio	Level of Significance
Essay Length	0.01	N.S.
T-Unit Length	0.00	N.S.
Clause Length	0.84	N.S.
Ratio of T-Units with Final Free Modifiers	0.18	N.S.
Ratio of Words in Final Free Modifiers	0.55	N.S.
Holistic Score	0.55	N.S.

Table 4.33. Comparison of Posttest Mean Scores on A_1B_1 Topic Data with Pretest Scores Covaried for "Analytic-Conventional" and "Analytic-Tutorial" Sections in Derivative Comparison 5 (see Table 2.2).

Factor	F-ratio	Level of Significance
Essay Length	0.77	N.S.
T-Unit Length	0.52	N.S.
Clause Length	0.01	N.S.
Ratio of T-Units with Final Free Modifiers	0.10	N.S.
Ratio of Words in Final Free Modifiers	0.14	N.S.
Holistic Score	0.07	N.S.

Table 4.34.   Comparison of Posttest Mean Scores on A_2B_2 Topics Data with Pretest Scores Covaried for "Analytic-Conventional" and "Analytic-Tutorial" Sections in Derivative Comparison 5 (see Table 2.2).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	36	18.97	2.89	23.00	3.11	- 4.03	3.55	-6.81	.001
Sentence Patterns	36	16.39	3.37	17.08	3.25	- 0.69	3.74	-1.11	N.S.
Paragraph Patterns	36	12.00	1.76	11.39	1.46	0.61	2.02	1.82	N.S.
Total Writing	36	47.36	5.89	51.47	5.32	- 4.11	5.41	- 4.56	.001
McGraw-Hill Reading Test									
Reading Comprehension	30	20.13	3.33	20.20	4.18	- 0.07	4.56	-0.08	N.S.
Daly-Miller Writing Apprehension Test	30	73.07	15.38	73.23	13.04	- 0.17	9.94	-0.09	N.S.

Table 4.35.   Paired T-Tests of Change Scores of Objective Tests for All "Analytic-Tutorial" Sections (09. 10, 15, and 16) in Derivative Comparison 5 (see Table 2.2).

Factor	F-ratio	Level of Significance
McGraw-Hill Writing Test		
Language Mechanics	2.56	N.S.
Sentence Patterns	0.27	N.S.
Paragraph Patterns	0.03	N.S.
Total Score	1.01	N.S.
McGraw-Hill Reading Test		
Paragraph Comprehension	3.37	N.S.
Daly-Miller Writing Apprehension Test	0.04	N.S.

Table 4.36. Comparison of Posttest Mean Scores on Objective Test Data with Pretest Scores Covaried for "Analytic-Conventional" and "Analytic-Tutorial" Sections in Derivative Comparison 5 (see Table 2.2).

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	521.22	163.42	457.17	160.47	64.06	146.06	1.86	N.S.
Words/T-units	16.02	3.58	16.35	3.26	- 0.33	4.22	-0.33	N.S.
Words/Clauses	9.33	1.09	9.31	1.81	0.02	2.53	0.04	N.S.
Ratio of TUs with FFM	0.066	0.05	0.093	0.09	- 0.016	0.10	-1.07	N.S.
Ratio of Words in FFM	0.041	0.04	0.057	0.06	- 0.016	0.07	-0.91	N.S.
Holistic Score	4.94	1.73	5.94	1.80	- 1.00	2.17	-1.96	N.S.
A_2B_2 Topics								
Words	508.83	124.57	531.00	120.12	-22.17	111.43	-0.84	N.S.
Words/T-units	16.32	3.27	17.95	3.94	- 1.63	3.88	-1.78	N.S.
Words/Clauses	10.62	1.67	10.92	1.50	- 0.30	2.18	-0.59	N.S.
Ratio of TUs with FFM	0.063	0.05	0.053	0.07	0.010	0.09	0.48	N.S.
Ratio of Words in FFM	0.037	0.03	0.027	0.04	0.010	0.05	0.82	N.S.
Holistic Score	5.39	2.09	6.39	1.58	- 1.00	2.52	-1.68	N.S.

Table 5 1.   Paired T- 'ests (N=18) of Change Scores on Writing Samples for "Analytic-Conventional"

Sec. ,ns (01, 02) in Principal Comparison 1 (see Table 2.1).

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Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	444.06	128.25	479.56	154.48	-35.50	112.90	-1.33	N.S.
Words/T-units	15.69	3.54	16.00	2.53	- 0.30	3.61	-0.36	N.S.
Words/Clauses	9.77	2.07	9.24	1.08	0.53	1.99	1.12	N.S.
Ratio of TUs with FFM	0.052	0.05	0.038	0.04	0.014	0.06	1.04	N.S.
Ratio of Words in FFM	0.031	0.04	0.024	0.03	0.007	0.04	0.67	N.S.
Holistic Score	4.39	1.79	4.44	1.85	- 0.06	1.95	-0.12	N.S.
A_2B_2 Topics								
Words	473.50	125.83	471.11	134.90	2.39	146.63	0.07	N.S.
Words/T-units	17.20	4.18	16.34	2.82	0.86	2.93	1.24	N.S.
Words/Clauses	10.27	1.75	10.46	1.71	- 0.19	1.58	-0.52	N.S.
Ratio of TUs with FFM	0.029	0.03	0.075	0.06	- 0.046	0.06	-3.61	.002
Ratio of Words in FFM	0.018	0.02	0.054	0.05	- 0.036	0.04	-3.56	.002
Holistic Score	4.22	1.48	5.33	2.30	- 1.11	2.42	-1.95	N.S.

Table 5.2.   Paired T-Tests (N=18) of Change Scores on Writing Samples for "Synthetic-Laboratory-Tutorial" Sections (04, 12) in Principal Comparison 1 (see Table 2.1).

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Factor	F-ratio	Level of Significance
Essay Length	3.07	N.S.
T-Unit Length	0.08	N.S.
Clause Length	0.01	N.S.
Ratio of T-Units with Final Free Modifiers	4.96	.033
Ratio of Words in Final Free Modifiers	4.56	.040
Holistic Score	4.91	.034

Table 5.3.   Comparison of Posttest Mean Scores on A_1B_1 Writing
Samples with Pretest Scores Covaried for
"Analytic-Conventional" and "Synthetic-
Laboratory-Tutorial" Sections (01, 02 vs. 12,04)
in Principal Comparison 1 (see Table 2.1).

Factor	F-ratio	Level of Significance
Essay Length	10.58	.003
T-Unit Length	4.53	.045
Clause Length	0.46	N.S.
Ratio of T-Units with Final Free Modifiers	1.51	N.S.
Ratio of Words in Final Free Modifiers	3.85	N.S.
Holistic Score	1.56	N.S.

Table 5.4. Comparison of Posttest Mean Scores on A_2B_2 Writing Samples with Pretest Scores Covaried for "Analytic-Conventional" and "Synthetic-Laboratory-Tutorial" Sections (01, 02, vs. 12, 04) In Principal Comparison 1 (see Table 2.1).

401

Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	15	19.53	2.64	21.80	4.11	- 2.27	3.97	-2.21	.044
Sentence Patterns	15	16.07	2.87	16.20	2.37	- 0.13	3.09	-0.17	N.S.
Paragraph Patterns	15	10.87	3.70	11.27	1.98	- 0.40	4.37	-0.35	N.S.
Total Writing	15	46.47	5.14	49.27	6.34	- 2.80	6.49	-1.67	N.S.
McGraw-Hill Reading Test									
Reading Comprehension	15	21.07	2.55	21.20	3.17	- 0.13	4.21	-0.12	N.S.
Daly-Miller Writing Apprehension Test	16	63.63	11.04	66.19	18.29	- 2.56	13.37	-0.77	N.S.

Table 5.5. Paired T-Tests of Change Scores on Objective Tests for "Analytic-Conventional" Sections (01, 02) in Principal Comparison 1 (see Table 2.1).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	17	19.65	3.69	21.53	4.03	- 1.88	3.14	-2.47	.025
Sentence Patterns	17	15.76	3.73	17.59	4.62	- 1.82	2.86	-2.63	.018
Paragraph Patterns	1⁻	11.18	2.51	11.35	2.21	- 0.17	2.40	-0.30	N.S.
Total Writing	17	46.59	8.23	50.47	10.05	- 3.88	5.51	-2.91	.010
McGraw-Hill Reading Test									
Reading Comprehension	16	18.88	6.86	19.81	3.41	- 0.94	6.57	-0.58	N.S.
Daly-Miller Writing Apprehension Test	14	65.71	18.88	67.00	14.41	- 1.29	10.63	-0.45	N.S.

Table 5.6. Paired T-Tests (N=18) of Change Scores on Objective Tests for "Synthetic-Laboratory-

Tutorial" Sections (04, 12) in Principal Comparison 1 (see Table 2.1).

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Factor	F-ratio	Level of Significance
McGraw-Hill Writing Test		
Language Mechanics	0.08	N.S.
Sentence Patterns	2.49	N.S.
Paragraph Patterns	0.05	N.S.
Total Score	0:26	N.S.
McGraw-Hill Reading Test		
Paragraph Comprehension	0.80	N.S.
Daly-Miller Writing Apprehension Test	0.03	N.S.

Table 5.7. Comparison of Posttest Mean Scores on Objective Tests
with Pretest Scores Covaried for "Analytic-
Conventional" and "Synthetic-Laboratory-
Tutorial" Sections (01, 02 vs. 12, 04) in
Principal Comparison 1 (see Table 2.1).

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	500.61	128.00	483.72	114.26	16.89	137.96	0.52	N.S.
Words/T-units	15.69	3.09	15.44	2.48	0.25	3.98	0.26	N.S.
Words/Clauses	9.16	1.60	9.38	1.79	- 0.22	2.24	-0.42	N.S.
Ratio of TUs with FFM	0.043	0.05	0.039	0.06	0.004	0.05	0.40	N.S.
Ratio of Words in FFM	0.028	0.03	0.022	0.04	0.006	0.03	0.85	N.S.
Holistic Score	4.83	1.20	5.17	1.65	- 0.33	2.14	-0.66	N.S.
A_2B_2 Topics								
Words	532.94	139.42	494.94	126.72	38.00	115.08	1.40	N.S.
Words/T-units	18.47	5.70	17.88	3.37	0.59	6.21	0.40	N.S.
Words/Clauses	10.81	2.32	10.82	1.95	- 0.01	2.46	-0.02	N.S.
Ratio of TUs with FFM	0.032	0.04	0.045	0.06	- 0.013	0.08	-0.69	M.S.
Ratio of Words in FFM	0.013	0.02	0.023	0.04	- 0.010	0.04	-1.07	N.S.
Holistic Score	4.72	1.78	5.17	2.07	- 0.44	2.04	-0.93	N.S.

Table 5.8. Paired T-Tests (N=18) of Change Scores on Writing Samples for "Analytic-Conventional"

Sections (05, 06) in Principal Comparison 2 (see Table 2.1).

407   408

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	465.00	160.29	480.39	152.42	- 15.39	82.95	-0.79	N.S.
Words/T-units	14.43	2.80	15.54	3.00	- 1.11	3.13	-1.50	N.S.
Words/Clauses	8.70	1.53	9.18	1.25	- 0.49	1.19	-1.75	[.099]
Ratio of TUs with FFM	0.020	0.02	0.031	0.03	- 0.012	0.04	-1.21	N.S.
Ratio of Words in FFM	0.011	0.02	0.020	0.02	- 0.009	0.03	-1.29	N.S.
Holistic Score	4.44	1.29	5.11	1.91	- 0.67	2.50	-1.13	N.S.
A_2B_2 Topics								
Words	458.94	152.18	575.94	189.72	-117.00	125.87	-3.94	.001
Words/T-units	15.86	3.20	17.50	3.70	- 1.64	3.51	-1.98	[.065]
Words/Clauses	10.57	1.89	10.74	1.38	- 0.17	1.37	-0.53	N.S.
Ratio of TUs with FFM	0.032	0.04	0.064	0.05	- 0.032	0.06	-2.38	.029
Ratio of Words in FFM	0.018	0.03	0.037	0.03	- 0.019	0.04	-2.22	.041
Holistic Score	4.33	1.72	5.06	1.83	- 0.72	2.42	-1.27	N.S.

Table 5.9. Paired T-Tests (N=18) of Change Scores on Writing Samples for "Synthetic-Conventional" Sections (07, 08) in Prinicpal Comparison 2 (see Table 2.1).

Factor	F-ratio	Level of Significance
Essay Length	0.31	N.S.
T-Unit Length	0.14	N.S.
Clause Length	0.01	N.S.
Ratio of T-Units with Final Free Modifiers	0.32	N.S.
Ratio of Words in Final Free Modifiers	0.76	N.S.
Holistic Score	0.05	N.S.

Table 5.10. Comparison of Posttest Mean Scores on A_1B_1 Writing
Samples with Pretest Scores Covaried for
"Analytic-Conventional" and "Synthetic-
Conventional" Sections (05, 06 vs. 07, 08) in
Principal Comparison 2 (see Table 2.1).

41.

Factor	F-ratio	Level of Significance
Essay Length	11.60	.002
T-Unit Length	0.01	N.S.
Clause Length	0.00	N.S.
Ratio of T-Units with Final Free Modifiers	1.05	N.S.
Ratio of Words in Final Free Modifiers	1.44	N.S.
Holistic Score	0.00	N.S.

Table 5.11. Comparison of Posttest Mean Scores on A_2B_2 Writing Samples with Pretest Scores Covaried for "Analytic-Conventional" and "Synthetic-Conventional" Sections (05, 06, vs. 07, 08) in Principal Comparison 2 (see Table 2.1).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	16	18.63	3.90	22.00	2.53	- 3.38	3.38	-3.99	.001
Sentence Patterns	16	16.25	2.46	18.13	2.34	- 1.88	2.36	-3.17	.006
Paragraph Patterns	16	11.50	3.46	11.56	1.50	- 0.06	3.97	-0.06	N.S.
Total Writing	16	46.38	5.58	57.69	4.19	- 5.31	4.84	-4.39	.001
McGraw-Hill Reading Test									
Reading Comprehension	17	18.94	3.58	20.71	2.66	- 1.76	3.80	-1.91	N.S.
Daly-Miller Writing Apprehension Test	18	64.72	14.74	66.06	17.49	- 1.33	8.56	-0.66	N.S.

Table 5.12.   Paired T-Tests of Change Scores on Objective Tests for "Analytic-Conventional" Sections

(05, 06) in Principal Comparison 2 (see Table 2.1).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	16	19.37	2.31	23.32	2.44	- 3.94	3.24	-4.87	.001
Sentence Patterns	16	15.37	1.93	17.94	2.54	- 2.56	2.96	-3.46	.004
Paragraph Patterns	16	12.50	1.27	11.19	1.11	1.31	1.92	2.73	.015
Total Writing	16	47.25	4.12	52.44	4.84	- 5.19	6.18	-3.36	.004
McGraw-Hill Reading Test									
Reading Comprehension	17	20.ᴦ4	4.15	20.53	3.48	0.41	4.54	0.37	N.S.
Daly-Miller Writing Apprehension Test	18	70.17	14.89	69.11	17.70	1.06	9.76	0.46	N.S.

Table 5.13.   Paired T-Tests of Change Scores on Objective Tests for "Synthetic-Conventional" Sections

(07, 08) in Principal Comparison 2 (see Table 2.1).

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Factor	F-ratio	Level of Significance
Essay Length	1.73	N.S.
T-Unit Length	0.03	N.S.
Clause Length	0.36	N.S.
Ratio of T-Units with Final Free Modifiers	0.10	N.S.
Ratio of Words in Final Free Modifiers	0.37	N.S.
Holistic Score	0.61	N.S.

Table 5.14. Comparison of Posttest Mean Scores on Objective Tests with Pretest Scores Covaried for "Analytic-Conventional" and "Synthetic-Conventional" Sections (05, 06 vs. 07, 08) in Principal Comparison 2 (see Table 2.1).

417

Factor	Pretest		Posttest					
	Mean	S.D.	Mean	S.D	Difference	S.D.	T-Value	Significance
A₁B₁ Topics								
Words	371.33	110.84	384.67	117.54	-13.33	94.75	-0.60	N.S.
Words/T-units	15.21	3.28	13.64	2.75	1.57	3.03	2.20	.042
Words/Clauses	8.12	1.12	8.08	1.53	0.44	1.31	0.14	N.S.
Ratio of TUs with FFM	0.061	0.07	0.030	0.04	0.031	0.07	1.93	N.S.
Ratio of Words in FFM	0.034	0.04	0.015	0.03	0.018	0.05	1.66	N.S.
Holistic Score	4.06	1.66	5.50	1.79	- 1.44	2.15	-2.85	.011
A₂B₂ Topics								
Words	385.11	135.38	393.17	142.23	- 8.06	122.48	-0.28	N.S.
Words/T-units	16.86	3.62	14.08	3.14	2.77	4.79	2.45	.025
Words/Clauses	10.60	1.82	8.59	1.49	2.01	2.64	3.22	.005
Ratio of TUs with FFM	0.037	0.04	0.035	0.05	0.002	0.05	0.19	N.S.
Ratio of Words in FFM	0.022	0.03	0.019	0.03	0.003	0.04	0.37	N.S.
Holistic Score	4.89	2.05	5.28	1.90	- 0.39	2.59	-0.64	N.S.

Table 5.15. Paired T-Tests (N=18) of Change Scores on Writing Samples for "Analytic-Conventional" Sections (17, 18) in Principal Comparison 3 (see Table 2.1).

419

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A₁B₁ Topics								
Words	407.83	122.05	395.50	91.34	12.33	103.31	0.51	N.S.
Words/T-units	16.26	2.65	15.64	2.43	0.62	2.76	0.96	N.S.
Words/Clauses	9.15	1.75	9.37	1.59	- 0.22	2.65	-0.35	N.S.
Ratio of TUs with FFM	0.051	0.06	0.067	0.07	- 0.016	0.09	-0.73	N.S.
Ratio of Words in FFM	0.027	0.04	0.039	0.05	- 0.012	0.06	-0.80	N.S.
Holistic Score	4.33	1.14	4.72	1.02	- 0.39	1.20	-1.38	N.S.
A₂B₂ Topics								
Words	405.83	126.90	462.67	114.04	-56.83	125.48	-1.92	N.S.
Words/T-units	17.23	2.55	16.82	2.65	0.41	3.22	0.54	N.S.
Words/Clauses	10.55	1.??	10.04	1.59	0.51	1.93	1.11	N.S.
Ratio of TUs with FFM	0.036	0.05	0.030	0.04	0.006	0.05	0.54	N.S.
Ratio of Words in FFM	0.017	0.03	0.016	0.02	0.001	0.03	0.13	N.S.
Holistic Score	4.83	1.92	5.44	2.04	- 0.61	2.66	-0.97	N.S.

Table 5.16. Paired T-Tests (N=18) of Change Scores on Writing Samples for "Analytic-Syllabus-Conventional" Sections (19, 20) in Principal Comparison 3 (see Table 2.1).

Factor	F-ratio	Level of Significance
Essay Length	0.10	N.S.
T-Unit Length	3.97	N.S.
Clause Length	4.93	.033
Ratio of T-Units with Final Free Modifiers	3.95	N.S.
Ratio of Words in Final Free Modifiers	3.05	N.S.
Holistic Score	3.22	N.S.

Table 5.17. Comparison of Posttest Mean Scores on A_1B_1 Writing Samples with Pretest Scores Covaried for "Analytic-Conventional" and "Analytic-Syllabus-Conventional" Sections (17, 18 vs. 19, 20) in Principal Comparison 3 (see Table 2.1).

Factor	F-ratio	Level of Significance
Essay Length	2.53	N.S.
T-Unit Length	7.63	.009
Clause Length	7.69	.009
Ratio of T-Units with Final Free Modifiers	0.11	N.S.
Ratio of Words in Final Free Modifiers	0.02	N.S.
Holistic Score	0.07	N.S.

Table 5.18. Comparison of Posttest Mean Scores on A_2B_2 Writing Samples with Pretest Scores Covaried for "Analytic-Conventional" and "Analytic-Syllabus-Conventional" Sections (17, 18 vs. 19, 20) in Principal Comparison 3 (see Table 2.1).

Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	17	19.35	4.17	21.06	5.96	- 1.71	5.22	-1.35	N.S.
Sentence Patterns	17	17.41	2.69	17.12	2.80	0.29	3.09	0.39	N.S.
Paragraph Patterns	17	11.47	3.06	11.47	1.94	0.00	3.48	0.00	N.S.
Total Writing	17	48.24	6.70	49.65	8.17	- 1.41	8.34	-0.70	M.S.
McGraw-Hill Reading Test									
Reading Comprehension	15	19.47	3.50	21.73	2.96	- 2.27	4.18	-2.10	N.S.
Daly-Miller Writing Apprehension Test	17	70.53	18.34	70.35	17.14	0.18	15.94	0.05	N.S.

Table 5.19. Paired T-Tests of Change Scores on Objective Tests for "Analytic-Conventional" Sections

(17, 18) in Principal Comparison 3 (see Table 2.1).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	17	18.35	3.10	22.65	3.59	- 4.29	4.15	-4.27	.001
Sentence Patterns	17	16.53	4.13	16.65	3.10	- 0.12	3.24	-0.15	N.S.
Paragraph Patterns	17	11.41	1.66	11.59	1.73	- 0.17	2.60	-0.28	N.S.
Total Writing	17	46.29	7.04	50.88	6.60	- 4.59	7.00	-2.70	.016
McGraw-Hill Reading Test									
Reading Comprehension	18	20.56	3.26	21.67	3.25	- 1.11	2.76	-1.71	N.S.
Daly-Miller Writing Apprehension Test	18	70.56	18.69	71.72	16.75	- 1.17	10.37	-0.48	N.S.

Table 5.20.   Paired T-Tests of Change Scores for Objective Tests for "Analytic-Syllabus-Conventional" Sections (19, 20) in Prinicpal Comparison 3 (see Table 2.1).

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Factor	F-ratio	Level of Significance
McGraw-Hill Writing/Test		
Language Mechanics	1.90	N.S.
Sentence Patterns	0.01	N.S.
Paragraph Patterns	0.03	N.S.
Total Score	0.80	N.S.
McGraw-Hill Reading Test		
Paragraph Comprehension	0.24	N.S.
Daly-Miller Writing Apprehension Test	0.11	N.S.

Table 5.21.   Comparison of Posttest Mean Scores on Objective Tests with Pretest Scores Covaried for "Analytic-Conventional" and "Analytic-Syllabus-Conventional" Sections (17, 18 vs. 19, 20) in Principal Comparison 3 (see Table 2.1).

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Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	406.17	155.30	387.11	131.74	19.06	124.08	0.65	N.S.
Words/T-units	13.87	2.14	15.40	2.95	- 1.53	3.06	-2.12	.049
Words/Clauses	8.93	1.45	9.38	1.23	- 0.45	1.93	-0.98	N.S.
Ratio of TUs with FFM	0.032	0.04	0.050	0.04	- 0.018	0.05	-1.57	N.S.
Ratio of Words in FFM	0.018	0.03	0.031	0.03	- 0.013	0.04	-1.50	N.S.
Holistic Score	4.50	1.76	4.61	1.46	- 0.11	1.81	-0.26	N.S.
A_2B_2 Topics								
Words	381.72	122.56	390.00	95.99	- 8.28	100.86	-0.35	N.S.
Words/T-units	16.38	3.07	17.38	3.81	- 1.00	4.01	1.05	N.S.
Words/Clauses	10.51	1.47	10.89	1.71	- 0.38	2.02	-0.80	N.S.
Ratio of TUs with FFM	0.043	0.07	0.029	0.03	0.014	0.06	0.96	N.S.
Ratio of Words in FFM	0.023	0.03	0.016	0.02	0.007	0.03	0.85	N.S.
Holistic Score	3.83	1.20	4.55	1.89	- 0.72	1.87	-1.64	N.S.

Table 5.22. Paired T-Tests (N=18) of Change Scores on Writing Samples for "Analytic-Conventional" Sections (13, 14) in Principal Comparison 4 (see Table 2.1).

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Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	469.50	129.52	431.89	125.77	37.61	100.98	1.58	N.S.
Words/T-units	15.13	3.65	15.72	3.05	- 0.59	3.53	-0.71	N.S.
Words/Clauses	8.57	0.86	9.23	1.59	- 0.66	1.28	-2.19	N.S.
Ratio of TUs with FFM	0.082	0.06	0.061	0.08	0.210	0.10	0.91	N.S.
Ratio of Words in FFM	0.050	0.04	0.032	0.04	0.018	0.06	1.36	N.S.
Holistic Score	5.56	1.38	5.17	1.72	0.39	1.88	0.88	N.S.
A_2B_2 Topics								
Words	447.22	105.00	468.89	109.57	-21.67	105.62	-0.87	N.S.
Words/T-units	17.79	3.24	16.60	2.69	1.19	3.77	1.34	N.S.
Words/Clauses	10.61	1.40	10.23	1.29	0.38	1.37	1.17	N.S.
Ratio of TUs with FFM	0.045	0.06	0.067	0.05	- 0.022	0.07	-1.29	N.S.
Ratio of Words in FFM	0.019	0.03	0.036	0.04	- 0.017	0.04	-1.69	N.S.
Holistic Score	4.17	1.72	4.89	1.71	- 0.72	2.42	-1.27	N.S.

Table 5.23. Paired T-Tests (N=18) of Change Scores on Writing Samples for "Analytic-Tutorial" Sections (15, 16) in Principal Comparison 4 (see Table 2.1).

Factor	F-ratio	Level of Significance
Essay Length	0.46	N.S.
T-Unit Length	0.03	N.S.
Clause Length	0.01	N.S.
Ratio of T-Units with Final Free Modifiers	0.06	N.S.
Ratio of Words in Final Free Modifiers	0.05	N.S.
Holistic Score	0.15	N.S.

Table 5.24. Comparison of Posttest Mean Scores on A_1B_1 Writing

Samples with Pretest Scores Covaried for

"Analytic-Conventional" and "Analytic-

Tutorial" Sections (13, 14, vs. 15, 16) in

Principal Comparison 4 (see Table 2.1).

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Factor	F-ratio	Level of Significance
Essay Length	2.33	N.S.
T-Unit Length	1.14	N.S.
Clause Length	2.02	N.S.
Ratio of T-Units with Final Free Modifiers	7.82	.009
Ratio of Words in Final Free Modifiers	4.36	.045
Holistic Score	0.21	N.S.

Table 5.25. Comparison of Posttest Mean Scores on A_2B_2 Writing

Samples with Pretest Scores Covaried for

"Analytic-Conventional" and "Analytic-

Tutorial" Sections (13, 14, vs. 15, 16) in

Principal Comparison 4 (see Table 2.1).

Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	15	18.73	3.17	21.40	4.79	- 2.67	4.48	-2.30	.037
Sentence Patterns	15	16.93	2.43	16.33	3.22	0.60	4.48	0.66	N.S.
Paragraph Patterns	15	12.00	2.14	11.20	2.48	0.80	2.31	1.34	N.S.
Total Writing	15	47.67	5.16	48.94	9.48	- 1.27	7.20	-0.68	N.S.
McGraw-Hill Reading Test									
Reading Comprehension	17	21.35	2.89	22.00	2.26	- 0.64	2.89	-0.92	N.S.
Daly-Miller Writing Apprehension Test	15	72.87	14.14	71.73	17.05	1.13	7.94	0.55	N.S.

Table 5.26. Paired T-Tests of Change Scores on Objective Tests for "Analytic-Conventional" Sections (13, 14) in Principal Comparison 4 (see Table 2.1).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	18	19.56	3.00	23.50	3.00	- 3.94	3.33	-5.02	.001
Sentence Patterns	18	15.89	3.25	16.83	3.12	- 0.94	3.28	-1.22	N.S.
Paragraph Patterns	18	12.17	1.50	11.56	1.25	0.61	1.50	1.73	N.S.
Total Writing	18	47.61	5.56	51.89	5.29	- 4.28	4.13	-4.40	.001
McGraw-Hill Reading Test									
Reading Comprehension	16	20.63	3.26	21.13	2.92	- 0.50	3.33	-0.60	N.S.
Daly-Miller Writing Apprehension Test	16	70.25	15.71	71.63	15.03	- 1.38	8.46	-0.65	N.S.

Table 5.27. Paired T- Tests of Change Scores on Objective Tests for "Analytic-Tutorial" Sections (15, 16) in Principal Comparison 4 (see Table 2.1).

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Factor	F-ratio	Level of Significance
McGraw-Hill Writing Test		
Language Mechanics	1.71	N.S.
Sentence Patterns	0.81	N.S.
Paragraph Patterns	0.21	N.S.
Total Score	2.21	N.S.
McGraw-Hill Reading Test		
Paragraph Comprehension	0.55	N.S.
Daly-Miller Writing Apprehension Test	0.60	N.S.

Table 5.28.   Comparison of Posttest Mean Scores on Objective Tests with Pretest Scores Covaried for "Analytic-Conventional" and "Analytic-Tutorial" Sections (13, 14 vs. 15, 16) in Principal Comparison 4 (see Table 2.1).

439

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A_1B_1 Topics								
Words	400.78	119.93	407.89	130.17	- 7.11	127.00	-0.24	N.S.
Words/T-units	14.06	2.49	14.41	2.58	- 0.35	3.66	-0.40	N.S.
Words/Clauses	8.36	1.27	8.28	0.70	0.08	1.23	0.26	N.S.
Ratio of TUs with FFM	0.032	0.05	0.042	0.05	- 0.010	0.06	-0.76	N.S.
Ratio of Words in FFM	0.015	0.03	0.023	0.03	- 0.008	0.03	-1.26	N.S.
Holistic Score	4.61	1.58	5.06	1.77	- 0.44	1.79	-1.05	N.S.
A_2B_2 Topics								
Words	407.44	134.24	456.50	141.33	-49.06	117.40	-1.77	N.S.
Words/T-units	15.61	2.78	15.94	3.01	- 0.33	3.44	-0.41	N.S.
Words/Clauses	10.14	1.30	10.13	1.46	0.01	1.49	0.04	N.S.
Ratio of TUs with FFM	0.032	0.05	0.015	0.03	0.017	0.05	1.35	N.S.
Ratio of Words in FFM	0.018	0.03	0.008	0.02	0.010	0.03	1.22	N.S.
Holistic score	4.44	1.65	5.44	1.79	- 1.00	2.11	-2.01	N.S.

Table 5.29. Paired T-Tests (N=18) of Change Scores on Writing Samples for "Analytic-Tutorial".
Sections (09, 19) in Principal Comparison 5 (see Table 2.1).

Factor	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
A₁B₁ Topics								
Words	307.00	163.75	391.89	143.46	- 84.89	89.74	-4.01	.001
Words/T-units	16.25	2.00	14.69	2.08	1.56	2.65	2.50	.023
Words/Clauses	9.15	1.56	8.89	1.44	0.26	1.43	0.77	N.S.
Ratio of TUs with FFM	0.038	0.06	0.045	0.05	- 0.007	0.06	-0.49	N.S.
Ratio of Words in FFM	0.018	0.03	0.026	0.03	- 0.008	0.04	-0.86	N.S.
Holistic Score	3.56	1.69	4.44	1.69	- 0.89	2.22	-1.70	N.S.
A₂B₂ Topics								
Words	383.17	105.40	529.78	164.15	-146.61	159.38	-3.90	.001
Words/T-units	17.90	3.28	17.95	3.21	- 0.05	4.93	-0.04	N.S.
Words/Clauses	10.73	1.56	11.14	2.90	- 0.41	3.12	-.056	N.S.
Ratio of TUs with FFM	0.043	0.05	0.071	0.08	- 0.012	0.08	-1.12	N.S.
Ratio of Words in FFM	0.019	0.02	0.032	0.04	- 0.012	0.04	-1.24	N.S.
Holistic Score	3.83	2.04	4.33	1.97	- 0.50	2.75	-0.77	N.S.

Table 5.30. Paired T-Tests (N=18) of Change Scores on Writing Samples for "Synthetic-Tutorial" Sections (21, 03) in Principal Comparison 5 (see Table 2.1).

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Factor	F-ratio	Level of Significance
Essay Length	1.71	N.S.
T-Unit Length	0.05	N.S.
Clause Length	0.78	N.S.
Ratio of T-Units with Final Free Modifiers	0.01	N.S.
Ratio of Words in Final Free Modifiers	0.06	N.S.
Holistic Score	0.25	N.S.

Table 5.31. Comparison of Posttest Mean Scores on A_1B_1 Writing
Samples with Pretest Scores Covaried for
"Analytic-Tutorial" and "Synthetic-Tutorial"
Sections (09, 10 vs. 21, 03) in Principal
Comparison 5 (see Table 2.1).

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Factor	F-ratio	Level of Significance
Essay Length	3.85	N.S.
T-Unit Length	2.82	N.S.
Clause Length	1.11	N.S.
Ratio of T-Units with Final Free Modifiers	7.75	.009
Ratio of Words in Final Free Modifiers	5.28	.028
Holistic Score	2.57	N.S.

Table 5.32. Comparison of Posttest Mean Scores on A_2B_2 Writing Samples with Pretest Scores Covaried for "Analytic-Tutorial" and "Synthetic-Tutorial" Sections (09, 10 vs. 21, 03) in Principal Comparison 5 (see Table 2.1).

Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	18	18.93	2.75	22.50	3.22	- 4.11	3.85	-4.53	.001
Sentence Patterns	18	16.89	3.50	17.33	3.25	- 0.44	4.23	-0.45	N.S.
Paragraph Patterns	18	11.83	2.01	11.22	1.67	0.61	2.48	1.05	N.S.
Total Writing	18	47.11	6.34	51.06	5.46	- 3.94	6.57	-2.55	.021
McGraw-Hill Reading Test									
Reading Comprehension	14	19.57	3.44	19.14	5.19	0.43	5.77	0.28	N.S.
Daly-Miller Writing Apprehension Test	14	76.29	14.90	75.07	10.57	1.21	11.59	0.39	N.S.

Table 5.33. Paired T-Tests of Change Scores on Objective Tests for "Analytic-Tutorial" Sections

(09, 10) in Principal Comparison 5 (see Table 2.1).

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Factor	N	Pretest Mean	S.D.	Posttest Mean	S.D	Difference	S.D.	T-Value	Significance
McGraw-Hill Writing Test									
Language Mechanics	16	17.00	4.31	20.13	5.03	- 3.13	3.54	-3.53	.003
Sentence Patterns	16	15.00	3.98	16.13	4.73	- 1.13	3.63	-1.24	N.S.
Paragraph Patterns	16	11.38	2.19	11.44	1.83	- 0.63	1.69	-0.15	N.S.
Total Writing	16	43.38	8.60	47.69	8.90	- 4.31	5.81	-2.97	.010
McGraw-Hill Reading Test									
Reading Comprehension	14	19.43	4.94	20.71	5.61	- 1.29	3.95	-1.21	N.S.
Daly-Miller Writing Apprehension Test	13	76.77	14.27	76.85	15.82	0.08	15.86	0.02	N.S

Table 5.34. Paired T-Tests of Change Scores on Objective Tests for "Synthetic-Tutorial" Sections (21, 03) in Principal Comparison 5 (see Table 2.1).

Factor	F-ratio	Level of Significance
McGraw-Hill Writing Test		
Language Mechanics	1.43	N.S.
Sentence Patterns	0.03	N.S.
Paragraph Patterns	0.41	N.S.
Total Score	0.26	N.S.
McGraw-Hill Reading Test		
Paragraph Comprehension	0.85	N.S.
Daly-Miller Writing Apprehension Test	0.12	N.S.

Table 5.35. Comparison of Posttest Mean Scores on Objective Tests
with Pretest Scores Covaried for "Analytic-Tutorial"
and "Synthetic-Tutorial" Sections (09, 10 vs. 21, 03)
in Principal Comparison 5 (see Table 2.1).

	Low Apprehensives (N=55)		High Apprehensives (N=55)				
	Mean	S.D.	Mean	S.D.	Difference	F-ratio	Significance
Factor							
Words	479.9	138.7	396.6	139.6	83.3	9.85	.002
Words/T-units	15.9	3.42	14.7	2.78	1.2	4.65	.033
Words/Clauses	9.58	1.59	8.43	1.41	1.55	16.06	.001
Ratio of TUs with FFM	.060	.063	.039	.045	.021	4.32	.040
Ratio of Words in FFM	.038	.042	.023	.030	.015	4.80	.031
Holistic Score	4.92	1.55	4.29	1.56	0.63	4.61	.034

Table 6.1. Comparison of Pretest Mean Scores for A_1R_1 Topic Data for High- and Low-Writing Apprehensives.

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	Low Apprehensives (N=55)		High Apprehensives (N=55)				
	Mean	S.D.	Mean	S.D.	Difference	F-ratio	Significance
Factor							
Words	487.4	146.5	413.1	127.6	74.3	8.05	.005
Words/T-units	17.4	4.30	16.6	2.87	0.8	1.52	N.S.
Words/Clauses	10.8	1.85	10.5	1.40	0.5	2.53	N.S.
Ratio of TUs with FFM	.047	.046	.027	.045	.020	5.19	.025
Ratio of Words in FFM	.026	.028	.015	.027	.011	4.47	.037
Holistic Score	4.54	1.90	4.25	1.79	0.29	.683	N.S.

Table 6.2. Comparison of Pretest Mean Scores for A_2B_2 Topic Data for High- and Low-Writing Apprehensives.

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Factor	Low Apprehensives (N=55)		High Apprehensives (N=55)		Difference	F-ratio	Significance
	Mean	S.D.	Mean	S.D.			
McGraw-Hill Writing Test (Total)	48.4	6.05	46.5	6.03	1.9	2.42	N.S.
SAT Verbal							
Reading Comprehension	48.3	7.18	46.1	7.01	2.2	2.00	N.S.
Vocabulary	48.3	7.99	43.9	8.52	4.4	6.34	.014
Total Verbal	485.6	62.1	451.5	75.9	34.1	6.57	.012
McGraw-Hill Reading Test	20.9	3.47	19.0	4.74	1.9	4.99	.028
English Composition Test	469.1	54.2	430.9	65.8	38.2	11.03	.001
Test of Standard Written English	48.1	6.26	44.8	8.83	3.3	4.11	.046

Table 6.3.   Comparison of Pretest Mean Scores Test Data for High- and Low-Writing Apprehensives.

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Step	Variable	F-ratio to enter	R^2	R^2 Change
1	Words/clauses 1	21.87	.1171	.1171
2	Total words 1	13.50	.1842	.0671
3	Ratio/words in FFM 2	6.31	.2106	.0304
4	McGraw-Hill Reading	6.25	.2438	.0292
5	Ratio/words in FFM 1	1.34	.2500	.0063
6	Words/T-units 1	1.03	.2543	.0048
7	Ratio/T-units with FFM1	.60	.2576	.0028
8	Words/clauses 2	.54	.2602	.0025
9	English Composition Test	.52	.2625	.0024

The following variables were also entered into the regression equation, but together failed to predict more than 2% of the remaining variance.

10	SAT Verbal
11	Holistic score 1
12	SAT-Reading Comprehension
13	Test of Standard Written English
14	Total words 2
15	McGraw-Hill Writing Test
16	Words/T-units 2
17	Ratio/T-units with FFM 2
18	Holistic score 2

Table 6.4. Stepwise Regression on 18 Variables as Predictors of Writing
Apprehension (N=161).

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Step	Variable	F to Enter	R^2	R^2 Change
1	Total Words	8.57	.0494	.0494
2	Ratio of Words in FFM	5.41	.0797	.0303

Table 7.1. Stepwise Regression on Five Variables as Predictors of Holistic Score on the A_1B_1 Posttest Essays.

Step	Variable	F to Enter	R^2	R^2 Change
1	Total Words	11.51	.0652	.0652
2	Ratio of Words in FFM	1.29	.0725	.0073
3	Ratio of T-units with FFM	1.15	.0790	.0065

Table 7.2. Stepwise Regression on Five Variables as Predictors of Holistic Scores on the A_2B_2 Posttest Essays.

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Step	Variable	F to Enter	R^2	R^2 Change
1	Total Words--A_2B_2	13.81	.0772	.0772
2	Ratio of Words in FFM--A_1B_1	8.44	.1224	.0452

Table 7.3. Stepwise Regression of Ten Variables as Predictors of the Summed Holistic Scores on the A_1B_1 and the A_2B_2 Posttest Essays.

Step	Variable	F to Enter	R^2	R^2 Change
1	Total Words	22.29	.1113	.1113
2	Ratio of Words in FFM	4.87	.1351	.0238
3	Words per T-Unit	2.93	.1493	.0142

Table 7.4. Stepwise Regression on Five Variables as Predictors of the Summed Holistic Scores for the Two Pretest and the Two Posttest Essay Sets.

Step	Variable	F to Enter	R^2	R^2 Change
1	Holistic Score--A_1B_1	10.15	.0580	.0580
2	SAT Verbal	5.97	.0910	.0331
3	Ratio of T-Units with FFM--A_2B_2	2.39	.1041	.0130
4	Ratio of Words in FFM--A_1B_1	1.67	.1133	.0092

Table 7.5. Stepwise Regression on 17 Pretest Variables as

Predictors of Course Grade in E 306.

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